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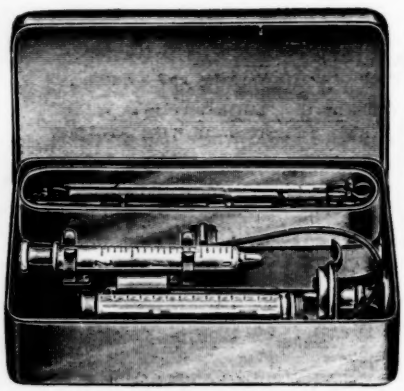

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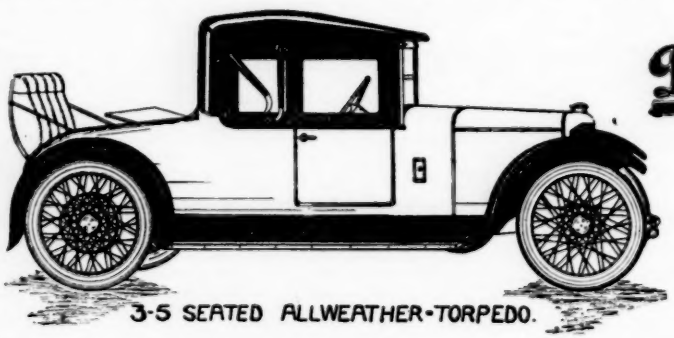

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CONTENTS

THE WHOLE OF THE LITERARY MATTER IN THE LANCET IS COPYRIGHT.

LUMLEIAN LECTURES on the Clinical Features of Foreign Bodies in the Bronchi. By Prof. THOMAS McCRAE, M.D., F.R.C.P. Lond.— Lecture I.—(*Illustrated.*)... 735

ORIGINAL ARTICLES.

Longevity of Parasitic Worms: The Term of Living Existence of Schistosoma Hæmatobium in the Human Body. By J. B. CHRISTOPHERSON, C.B.E., M.D., F.R.C.P. 742

Idiosyncrasy to Adrenalin, with Reference to its Employment with Local Anæsthetics and in Goetsch's Test for Hyperthyroidism. By H. E. SYMES-THOMPSON, M.A., M.D., M.R.C.P. 743

Measurement of Ultra-Violet Light by Means of an Acetone Methylene-blue Solution. By A. WEBSTER; LEONARD HILL, M.B., F.R.S.; and A. EIDINOW, M.B., B.S. 745

Massive Doses of Digitalis in Auricular Fibrillation without Heart Failure. By JULIUS JENSEN, M.R.C.S.—(*Illustrated*) . 747

CLINICAL AND LABORATORY NOTES.

A Case of Fibromyoma of the Stomach. By J. E. G. CALVERLEY, C.M.G., M.D., B.S. 748

A Case of Bilateral Herpes Zoster. By E. R. C. WALKER, B.A., M.B., Ch.B. 749

MEDICAL SOCIETIES.

North of England Obstetrical and Gynæcological Society: Primary Pulmonary Thrombosis.... 749

Glasgow Southern Medical Society: Intussusception..... 752

Brighton and Sussex Medico-Chirurgical Society: Electrocardiographic Records 752

REVIEWS AND NOTICES OF BOOKS.

Canned Foods in Relation to Health. By William G. Savage, B.Sc., M.D... 753

Galvanomagnetic and Thermomagnetic Effects. By Prof. L. L. Campbell, Ph.D. 753

Handbuch der Tropenkrankheiten. General Editor: Prof. Dr. Carl Mense. 753

Selected Essays on Orthopædic Surgery from the Writings of Newton Melman Shaffer, M.D. 753

Die Normale und Pathologische Physiologie des Knochens. By Dr. Walther Müller 754

Anæsthesia in Dental Surgery. By T. D. Luke, M.D. Edited by J. Stuart Ross, M.B. 754

The Physiology of Photosynthesis. By Sir J. C. Bose 754

The Kingdom of Evils. By E. E. Southard, M.D., and Mary C. Jarrett 754

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LEADING ARTICLES.

AMBULANCE CASES IN LONDON 757

ALCOHOL AND LONGEVITY 758

THE SIZE OF INFECTIVE VIRUSES 759

GLASGOW ROYAL INFIRMARY: THE LISTER WARD 759

ANNOTATIONS.

Provision for Defective Children in London 760

Partial Gastrectomy: a Return to Billroth I. .. 760

Broken Glass as a Poison. 761

Pre-operative Diagnosis of Embolism of a Renal Artery 761

Drug Idiosyncrasy, with Special Reference to Adrenal 762

Post-Serotherapeutic Amyotrophic Paralysis 762

The Pirates' Who's Who.. 762

Infectious Scleroma in Czecho-Slovakia 763

Sarcoma of the Penis..... 763

PUBLIC HEALTH SERVICES.

Insurance Medical Service: The Capitation Fee Settlement: Source of the New Funds..... 774

MODERN TECHNIQUE IN TREATMENT.

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LXVI.—The Treatment of Hæmorrhage following Tooth Extraction. By W. WARWICK JAMES, F.R.C.S., L.D.S. 764

SPECIAL ARTICLES.

Small-pox and Vaccination: Dr. Killick Millard's Views. By JOHN C. McVAIL, M.D... 765

The Effects of Radium and X Rays upon Normal and Cancerous Tissues .. 770

Paris: The Inauguration of the Anti-Cancer Centre at Montpellier 771

Holland: A New Disease Prevention Act 772

King Edward's Hospital Fund for London 772

MEDICINE AND THE LAW.

The Harnett Case Appeal. 773

The Public Authorities Protection Act 773

Cancer of the Scrotum in a Mule-spinner: A Test Case 773

CORRESPONDENCE.

"Blind Cæcostomy" (Mr. W. H. Ogilvie) 775

The United Kingdom Free Hospital Insurance Fund: A Correction from King Edward's Hospital Fund for London (Lord Somerleyton) 775

The Pancreas and Diabetic Metabolism (Dr. George Graham)..... 775

Neglect of the Early Symptoms of Insanity (Dr. John Warnock) ... 776

Certificates of Insanity (Dr. Ian D. Suttie) 776

Preparing Hands and Gloves for Operation (Mr. G. H. Colt) 777

Insulin by the Skin and Mouth (Maj. H. H. King) 777

THE SERVICES.

Royal Army Medical Corps.—Royal Air Force.—Indian Medical Service.. 786

PARLIAMENTARY INTELLIGENCE.

Notes on Current Topics: Protection Against Lead Poisoning.—National Health Insurance (Cost of Medical Benefit) Bill. 779

House of Lords: Therapeutic Substances Bill.. 779

House of Commons: Inquiry into Lunacy Laws.—Village Settlements for Tuberculous Men.—Local Tribunals under Midwives Board.—Cancer in Birmingham.—Tuberculin-tested Milk.—Medical Evidence in Final Pension Awards.—Experimental Inoculations of Animals.—Recruitment of Junior R.A.M.C. Officers 779

OBITUARY.

Frederick William Higgs, M.D., M.R.C.P. 777

Frederick Womack, M.B., B.Sc. 777

William Alfred Wills, M.D., F.R.C.P. 777

William Henry Coates, M.B. M.R.C.S. 778

Edwin Claude Taylor, M.D., M.S., F.R.C.S. 778

Thomas Ridge Jones, M.D., M.R.C.S. 778

MEDICAL NEWS.

University of London 781

Royal Society 781

Royal College of Physicians of Ireland 781

Ella Sachs Plotz Foundation 741

Kent County Ophthalmic Hospital, Maidstone.... 749

London School of Hygiene and Tropical Medicine.. 774

West Kent Medico-Chirurgical Society 778

Royal Eastbourne Eye Hospital 781

Royal Medical Benevolent Fund 781

Beneke Centenary 781

Dr. Schweitzer's Return to Africa 781

Donations and Bequests.. 781

King Edward VII. Hospital, Windsor 782

Cancer Hospital 782

Royal West Sussex Hospital, Chichester 782

Royal Victoria Hospital, Belfast 782

West Kent Hospital 782

NOTES, COMMENTS, AND ABSTRACTS.

A Report on the Voluntary Hospitals System..... 784

The Founding of the U.S.A. War Hospitals 785

Handbooks on British and Foreign Spas..... 786

Research on Contraceptives 786

Medical Diary..... 782

Appointments 783

Vacancies 783

Births, Marriages, Deaths 783

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The causes responsible for the entrance of foreign bodies into the air passages are inherent in human nature and are not peculiar to any country. The most important factor in adults and older children is the reprehensible habit of using the mouth as a sort of hold-all for objects such as pins, tacks, nails, &c. The individual is startled, coughs, laughs, speaks, or makes a sudden movement, and with the succeeding inspiration the object passes into the air passages. In small children there is a common tendency to introduce any object, whose size does not forbid, into the mouth, and the possibility of aspiration into the trachea is always present. The factor of imitation is also important. The child sees the mother or nurse putting pins into the mouth, and nothing is more natural than to follow the example. A dentist may permit an extracted tooth, a dental fitting, or a small instrument to fall back into the pharynx whence it may pass into the larynx. (Fig. 1.) Pieces of bone may be aspirated, and in this case hurried eating is usually responsible. Many candies contain nuts, which may be aspirated after the soluble candy is dissolved. In general, we may regard carelessness as the main contributing cause in those who have reached years of discretion. In the cases in which the foreign body gains entrance during anæsthesia the patient is innocent, but there is usually carelessness on the part of someone.

Variety of Objects Inhaled.

The variety of objects, both in size and character, which may gain entrance to the air passages is remarkable. The largest of which I know was an oyster which passed as far as the bifurcation of the trachea, a portion passing into each bronchus and causing complete obstruction, the patient dying quickly. The smallest was a portion of nut aspirated while the patient was chewing. The diverse character of objects is worthy of note. As might be expected, pins are common, both the ordinary variety and safety-pins. (Figs. 2 and 3.) The latter are often aspirated when open, adding to the difficulty of extraction, as the point often penetrates the wall of the trachea or bronchus. Tacks and small nails and screws are comparatively common, the brass-headed variety being especially frequent in small children, whose attention is, no doubt, attracted by the appearance. (Fig. 4.) Small toys and portions of toys are not uncommon. (Fig. 5.) Buttons, beads, and small pieces of jewellery are easily aspirated. Bones may pass into the air passages, especially soft chicken bones. A very important and large group includes nuts, beans, and seeds. (Fig. 6.) In the United States the peanut is a favourite article of consumption—alone or in candy—and either a whole nut or a portion is easily aspirated. The folly of giving nuts to young children who cannot chew them is evident. The form of candy which contains nuts is a frequent source, as after the candy is dissolved the nut remains. A child often eats rapidly and chokes easily, and as this is followed by a deep inspiration the aspiration of a portion of nut readily follows. Grains of corn, various seeds, especially of the water-melon, and pieces of grass and bark are among the objects which gain entrance to the air passages.

The relative frequency of the substances of vegetable origin is shown by the figures of 100 consecutive cases. A peanut, or a portion of one, was found in 45 cases, a grain of corn (maize) in 17, a water-melon seed in 15, and miscellaneous objects in the remainder. This last group includes shells of various nuts, beans, almond nuts, walnuts, coffee-berry, apple-stems, burrs, &c.

The influence of the flora of a district is well demonstrated by H. M. Taylor,[2] of Florida, who reports a number of cases in which the sand spur, which is common in that State, gained entrance to the air passages. This has sharp barbed spines, which usually catch in the larynx.

The determining factors are many. While having an object in the mouth the individual speaks, laughs, coughs, makes a mis-step, or is startled. The next inspiration, which may be an unusually strong one, draws the object into the larynx. The contact of a foreign body excites cough, and the tendency to take a deep inspiration before coughing naturally favours aspiration of the substance. Everyone has experienced the discomfort of having a drop of water or a crumb "go the wrong way." This often occurs without any evident reason. If an object is held in the mouth it may pass into the air passages just as easily. Some of the cases result from various combinations of circumstances. For example, a mother was holding her child, aged 3 months, in her lap when a small open safety-pin insecurely fixed in the mother's dress fell into the child's mouth and passed into the larynx. The pin was removed 36 hours later, the child being none the worse. In another case a man was asked to pin his nephew's collar at the back. He placed the pin in his mouth and the nephew then gave him a sudden blow on the abdomen with his elbow. There was a natural sudden start followed by a deep inspiration and the pin disappeared. It was removed some days later from a bronchus.

As a rule the foreign body travels downward in the air passages as far as possible. In a certain proportion of cases the body remains in the trachea; this may be for a time only or until removed. Permanent lodgment in the trachea may result from the size of the object in some cases, but more often from its shape or from its having a sharp point which becomes fixed in the wall. The object is more likely to enter the right main bronchus than the left, the proportion entering the right side being about 66 per cent.

[1] Chevalier Jackson: Surgery, Gynecology, and Obstetrics, March, 1919, pp. 208–268.

[2] Jour. Amer. Med. Assn., 1921, 77, 685.

Dr. Jackson's work has shown that the most frequent site of lodgment is at or just below the giving off of the right upper lobe bronchus and the next most frequent the corresponding spot on the left side. Next come the stem bronchi, the dorsal branches being more often invaded than the ventral branches. The branch most frequently invaded is the large posterior branch of the left lower lobe bronchus which is given off immediately below the upper lobe bronchus.

Symptoms at Time of Aspiration.

A study of the symptoms at the time of aspiration is important, because in many cases the diagnosis is not made because there was no special resulting distress. There may be great variation in the immediate symptoms. If the body remains in the trachea there is usually extreme distress with dyspnœa, decreased if the object passes into a bronchus. A movable body in the trachea usually causes marked distress. An object such as a safety-pin may result in slight symptoms only. In many cases there is considerable distress with choking, strangling, and coughing, which, however, soon lessen. In some cases in adults who knew that the object had passed into the air passages, the statement is made that there was surprisingly slight discomfort. Naturally, the size and character of the object influence markedly the severity of the initial symptoms. Certain cases in adults in which there was no knowledge of even the possibility of a foreign body having gained entrance to the air passages prove that there may not be sufficient symptoms at the time of aspiration to attract attention. Some of the accounts given by the patients are as follows:—

1. A woman was having dental work done, and a small dental instrument was placed in a root canal. She felt it slip out of the tooth and lodge on the tongue. She tried to take hold of it, but it slipped from her fingers into the air passages. She had an attack of severe coughing, but nothing more.

2. A man standing on a ladder and holding a staple an inch long in his mouth was asked a question; in answering it the staple disappeared. There were no symptoms of any kind at the time. Next day he had a tickling sensation in the throat, which led him to consult a physician.

3. While a dentist was fitting a gold bridge it slipped from his hand and was aspirated. The patient had a momentary sensation of something in the throat, and an attack of coughing much the same as if a drop of fluid had "gone down the wrong way." The lack of any respiratory distress led to the view that the object had been swallowed.

4. A child came into the house and announced that she had swallowed part of a toy. There was such an absence of disturbance of any kind that the parents refused to believe her. The truth of her story was proved seven years later by the removal of the object.

5. A young woman aspirated a safety-pin, which she said "went down as easily as a drink of water."

These cases illustrate how little disturbance there may be from the aspiration of a foreign body. Between them and the cases with a maximum severity of symptoms, as when the body is in the trachea or sets up a severe general tracheo-bronchitis, there is every variation. In many patients after a period of distress and severe cough the main complaint is of cough and dyspnœa, which vary greatly in severity. In young children nothing may be known of the initial symptoms; the child may be too young to tell or may be frightened and make no mention of the happening.

After the symptoms which occur at the time of aspiration, special importance belongs to the period after the foreign body has gained entrance. The first symptoms may be of short duration and following this there is often a *quiescent interval* in which symptoms are entirely lacking or are so slight that they do not attract attention. This quiescent period has often been responsible for the opinion that it was impossible that a foreign body was in the air passages. This symptomless period is most deceptive, as the initial manifestations, which may be slight or severe, are quite forgotten when later symptoms appear and an association between the two is not recognised. Many such cases might be reported.

Nail in Bronchus.—A boy, aged 14 years, was admitted on Oct. 8th, 1923, without any complaint of symptoms, but a knowledge of having "swallowed" a nail. On Oct. 6th, 1923, he had a nail, from which the head had been removed, in his mouth. He laughed and the nail disappeared. It stuck in his throat for a short time, causing gagging, and then he felt it pass downward. After this he did not have a symptom of any kind. His mother insisted on an X ray study, which showed the nail in the left lower lobe bronchus. The only sign observed was decreased expansion in the lower left thorax.

A boy, aged 6 years, was admitted on Nov. 12th, 1923, complaining of cough and wheezing respiration. About two and a half years before the child became very ill, without any definite cause, and the condition was diagnosed as pleurisy. The mother thought that he had been playing with a nail which disappeared. The child recovered and seemed perfectly well. Some time later the child began to cough, and this gradually became more troublesome. In October, 1923, an X ray plate was taken, which showed the nail in the right lower lobe bronchus. The child showed lack of both physical and mental development, and extreme clubbing of the fingers. The breath had a very foul odour. The signs over the lower right lung were marked and varied from day to day, evidently depending on the relative amounts of air and secretion present. The blocking of the bronchus was not complete. At bronchoscopy (Jackson) a stricture was found in the lower right lobe bronchus, below which was a cavity containing foul pus in which the nail was found.

This period of freedom from symptoms is specially emphasised, as ignorance of its occurrence has so often led to the supposition that a foreign body could not be present owing to the absence of symptoms. In many cases this quiescent period does not occur, and symptoms are constant from the time of aspiration.

Resulting Changes.

It is evident that many factors may influence the changes which result from the presence of the foreign body. Some of these are worthy of discussion.

1. *Age.*—The air passages of infants and young children react much more severely to the irritation of a foreign body than do those of older children and adults. This applies especially to the subglottic region in children below a year and a half of age. Swelling may be excited by many factors, and among foreign bodies the irritation produced by a nut is specially acute.

2. *Trauma.*—This may be direct, as when the foreign body is moved about actively by respiration and cough, especially in the trachea, or by injury from the point of a pin or the edges of a sharp object. Infection of the tissues may result if the mucosa is injured.

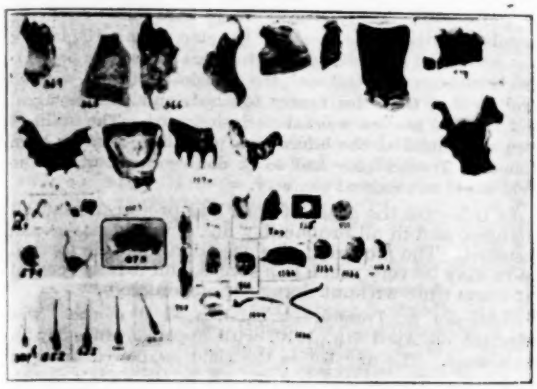
3. *Mechanical.*—The foreign body may injure the mucosa to a greater or less extent. In the case of a bean the absorption of moisture may cause it to swell and so increase the pressure. The swelling of the mucous membrane, which results from inflammation, acts in the same way. The interference with the passage of air is discussed subsequently.

4. *Special Forms of Irritation.*—These are seen particularly with nuts, beans, and substances of vegetable origin. A most intense tracheo-bronchitis is set up, which requires special discussion.

5. *Infection.*—This may result quickly or slowly. If very intense, as in the peanut cases, this may kill the patient in a short time. In the more chronic cases there is the formation of foul pus often associated with abscess formation and bronchiectasis. Fibroid changes may follow, and bronchial stenosis is common. The formation of abundant granulations is common, and these may be found above the foreign body, evidently sometimes due to its position having shifted.

As these changes may occur in many combinations, it is evident that the resulting physical signs must

FIG. 1.

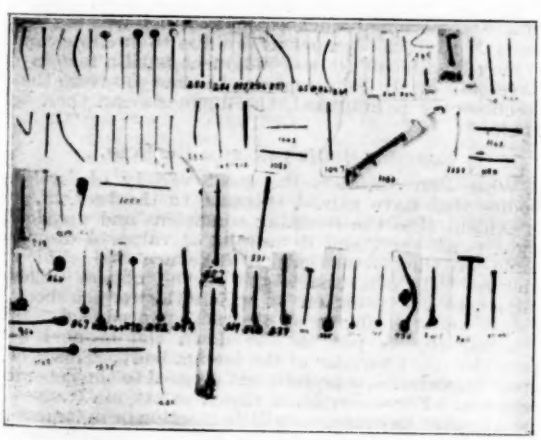


Dental plates and instruments. The largest plates were removed from the œsophagus.

FIG. 2.

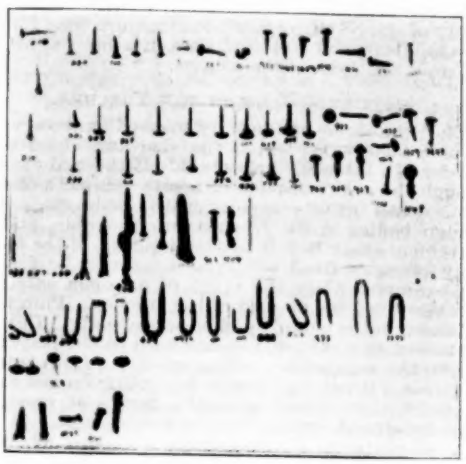
Safety-pins removed from the trachea and bronchi.

FIG. 3.



Pins of various kinds removed from the bronchi.

FIG. 4.

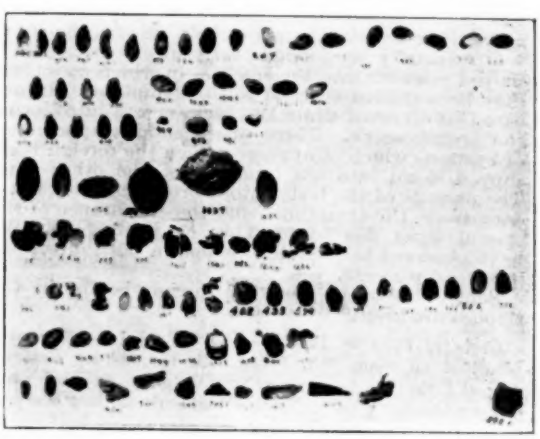


Tacks and staples removed from the bronchi.

FIG. 5.

Bullets and toys. Some of the latter were removed from the œsophagus

FIG. 6.



Seeds, shells, &c., removed from the bronchi.

show great variations. This is particularly marked if the blocking of the bronchus is not complete, and in this case the signs may change from hour to hour. Many of the resulting conditions require time for their development, and so the picture in acute recent cases differs much from chronic cases.

FOREIGN BODY IN THE TRACHEA.

The symptoms are usually marked and vary with several factors, of which the size and character of the foreign body are important. If the body is large enough to cause complete or nearly complete obstruction, death results rapidly with asphyxia. Many foreign bodies in the trachea are movable, and the movements may be felt by the patient. If the foreign body becomes fixed the symptoms may be few, as, for example, when the point of an open safety-pin becomes fixed in the wall of the trachea. Pain is not common, but is complained of occasionally. *Dyspnœa* is marked as a rule, and is due both to the body itself and to the subglottic swelling resulting from trauma. *Cyanosis* is usual, the degree depending on the extent of obstruction. *Cough* generally begins at once, and may be almost continuous or paroxysmal. It may suggest pertussis or may have a croupy character which always suggests subglottic swelling. Cough is most marked when the foreign body is movable, and one phenomenon of importance is the sudden shutting off of the expiratory air and of phonation during the act of coughing. A loud *wheeze* is usually present. This sound is difficult to describe, but when once heard is easily recognised. It differs somewhat from the wheezing sounds of bronchial asthma, being higher pitched and more intense. It may be heard with inspiration or expiration, sometimes with both. It is heard at the patient's mouth, either with the ear or by the stethoscope, with the bell held close to or even in the mouth. It varies greatly in loudness. It is not heard on auscultation over the chest wall as a rule. It may be heard at some distance from the patient. The designation "asthmatoid wheeze" has been given to it by Jackson. The voice may be hoarse. In some cases there is a remarkable *slapping sound* which may be present with each respiration, only with a deep breath or with the act of coughing. It was very marked in a child with a water-melon seed in the trachea, in whom the sound produced by the seed striking against the larynx could be heard at some distance. At the same time the *impact* may be felt by the finger on the trachea. There is sometimes a curious sound heard, which has been termed "tracheal flutter." The examination of the thorax shows little except on auscultation. There is no difference between the sides on inspection or percussion. On auscultation the breath sounds are usually harsh and loud, the degree of change depending largely on the degree of obstruction. If the foreign body has caused much irritation and resulting secretion, which passes into the bronchi, there are many coarse râles heard throughout both sides of the chest.

Occasionally a foreign body in a bronchus is moved upwards into the trachea, in which case there may be a sudden onset of severe symptoms. In one case this occurred while Dr. Jackson was introducing the bronchoscope. There was a sudden appearance of cyanosis which disappeared when the foreign body slipped down into the bronchus of the other lung. The passage of the body into a bronchus results in a decrease in the symptoms, and the appearance of the special signs due to blocking of a bronchus. We have observed this sudden change in both directions in several patients.

Some illustrative cases of foreign bodies in the trachea are given.

Grain of Corn in Trachea.—A boy, aged 3 years, was admitted on Sept. 6th, 1923, with the history that on August 27th, 1923, he was removing the grains from a dry cob of corn (maize) with his teeth. Suddenly he had a severe choking attack, and following this almost constant cough and wheezing respiration. The child showed marked inspiratory dyspnœa, suprasternal retraction, and depression over the lower third of the sternum, which was increased with each inspiration. The percussion note was hyper-resonant throughout. Inspiration was loud and prolonged, while expiration was scarcely heard. There were coarse rumbling sounds over the whole thorax. The slap against the larynx was well heard and felt, and the tracheal flutter was present. On bronchoscopy (Jackson) the subglottic tissue was so swollen that the sides nearly touched, and the laryngeal and tracheal mucosa was intensely inflamed. The grain of corn was found at the bifurcation partially occluding both bronchi. Tracheotomy had to be done subsequently; the child made an excellent recovery.

In this case the grain of corn had produced marked changes, and in all probability death would have soon resulted. The picture in the case of a metallic foreign body may be very much less severe, and it may remain for some time without doing serious damage.

Safety-pin in Trachea.—A child, aged 9 months, was admitted on April 7th, 1919, with apparent difficulty in swallowing. The day before the child swallowed an open safety-pin. The mother saw the pin in the child's mouth and made an unsuccessful attempt to remove it. There was no dyspnœa or cough, and the only symptom was an apparent disinclination to swallow. The examination was absolutely negative. There was no distress or dyspnœa, and no abnormal signs found in the thorax. The X ray study showed the safety-pin in the trachea, point upwards, and the keeper-end just in the opening of the glottis. There was acute laryngo-tracheitis found; the pin was removed by Dr. Jackson in seven seconds.

The *diagnosis* of a foreign body in the trachea is not difficult in the majority of cases, especially if there is a definite history of choking when there was an object in the mouth. The greatest difficulty is found in young children, especially if the history is indefinite. Subglottic swelling is common, giving hoarseness and a croupy cough. Naturally *diphtheria* is suspected, and an interesting commentary on this is the number of patients with foreign bodies in the trachea to whom diphtheria antitoxin had been given. If the foreign body shows in the X ray plates there is no difficulty. As the metallic bodies give the least in the way of symptoms and signs but show in the X ray plate, they should not be missed if the suspicion of a foreign body is entertained. With bodies non-opaque to the X rays there are usually more symptoms and signs and so the diagnosis should be suggested. The occurrence of a "wheeze," the "audible slap," and the palpation of the impact of the foreign body are practically pathognomonic. In the absence of the last two, care should be taken not to be misled by the signs of a foreign body in a bronchus for the recognition of which a proper examination of the thorax should be sufficient. To exclude *diphtheria* direct laryngoscopy with the taking of cultures is usually sufficient. Considerable difficulty arises from trauma due to a previous bronchoscopy in which nothing was found. Here the symptoms are due to swelling, and it may be difficult to pass judgment until a few days have passed. If the symptoms become so severe that tracheotomy is indicated, the diagnosis can then be made.

FOREIGN BODIES IN THE BRONCHI.

When one considers the great variety of foreign bodies that have gained entrance to the bronchi, it is evident that the resulting conditions and physical signs must vary, and it may be of value to discuss some of the factors which influence the clinical picture. (1) *Size* and *shape* of the object. This influences the situation at which the foreign body lodges and the degree of obstruction produced. In general, objects pass as far down the bronchi as possible. (2) *Character* of the foreign body. This is of great importance, especially with regard to the general reaction. For example, a closed safety-pin causes, for a time at any rate, very little reaction or inflammation. Metallic foreign bodies act by causing local irritation and obstruction to which infection and the

formation of pus are added subsequently. Certain substances, in addition, set up a most intense inflammatory process, apparently through some irritant action. Nuts and other vegetable substances belong in this category, and to them special attention will be given subsequently. (3) There may be several particles of a foreign body aspirated, as, for example, when a nut is being chewed and a number of small particles pass into the bronchi. (4) The amount of resulting secretion and irritation varies.

With regard to the bronchus and lung, there are a number of possibilities which apply to a lobe or a whole lung. This is true not only as regards the affected portion of lung, but there may be a great variation as regards the condition of the other lung and the position of the heart. When a foreign body lodges in a bronchus there are several possibilities.

1. *It may plug the bronchus completely.* In this event the air in the affected lung is rapidly absorbed. With this one of two things, or a combination of both, results. The lung may collapse or there may be secretion into the air cells, and apparently an increase of fluid in the tissues so that the lung becomes "water-logged." It may be impossible from the signs over the lung to decide which is present, but if any considerable portion of lung is involved the position of the heart and diaphragm is of value. In many cases the condition seems to be a combination of collapse and increase of fluid content. Evidently the view that there may be increase of the fluid content is difficult to prove, but the points supporting it are: (*a*) signs suggesting that the portion of lung contains no air; (*b*) the X ray picture shows a dense shadow; and (*c*) the rapid clearing after the removal of the foreign body. A solid exudate could not be absorbed with the rapidity with which such a lung clears. This may require only a few hours. There is always the formation of pus below the foreign body if it is present for any time. The affected area shows limitation of movement, absence of vocal fremitus, dullness on percussion, and absence of breath sounds and râles. If the patient is seen before the air is absorbed there may be tympany on percussion. In children the note frequently has a marked tympanitic quality, sometimes over small areas and for varying periods. Difference in the degree of collapse and the amount of secretion may explain this. In children distant breath sounds may be heard, possibly conveyed from the opposite side, especially in the back. The unaffected lung shows *compensatory* emphysema.

2. *The foreign body allows air to pass in but not out.* This is associated partly with the change in the bronchi during inspiration and expiration. With the former the bronchus dilates, and so may permit air to pass the foreign body; with expiration the bronchus contracts and so may shut down tightly on the foreign body, not allowing any air to pass. (Fig. 7.) The result is that the affected lung or lobe becomes over-distended with air—*obstructive* emphysema. The percussion note shows hyper-resonance or tympany, and vocal fremitus is usually absent. The breath sounds are absent as a rule, but occasionally they are heard during inspiration. The presence of râles is variable; they are heard in some cases. The picture is in some ways much like pneumothorax. In a few cases pneumothorax has occurred, apparently from rupture of an air vesicle, but the amount of air which escapes has not been large. In other patients air has escaped into the mediastinal tissues. The respiratory movements disappear, the diaphragm is depressed, and the heart is displaced to the unaffected side. In such an event it is easy to mistake the side involved, both by the physical signs and the X ray study. The unaffected lung apparently has less resonance, and in the X ray plate shows a greater shadow in contrast to the over-distended lung.

3. There is *partial blocking* of the bronchus. In this event some air passes in and out and secretions can escape. Depending on the extent of the escape of secretions the signs change, as the relative amounts of air and secretion vary from time to time. There is decreased expansion of the affected side, and the vocal fremitus is diminished. The breath sounds are heard, usually rough and blowing, sometimes with a curious whistling or snoring character. Râles are numerous and of many kinds, but usually coarse, musical, or snoring.

Certain other factors operate to a varying degree.

1. There is nearly always some *swelling of the mucous membrane.* This tends to close the bronchus, and, in many cases in which the foreign body itself could not plug the bronchus, as, for example, a small bar pin, the resulting swelling does so.

2. *Granulations.*—These form rapidly and may play a considerable part in causing obstruction. In some cases they extend upwards in the bronchi. Thus a patient when first seen may have a foreign body blocking the lower lobe bronchus with the bronchus to the upper lobe quite open. Gradually the upper lobe bronchus becomes obstructed, and at bronchoscopy the granulations extend to the bifurcation of the trachea, the foreign body being found in the lower lobe bronchus. In many such cases strong effort, as in violent coughing, may force secretion through the granulations. The foreign body may be found embedded in a mass of granulation tissue.

3. *Secretion.*—This forms very rapidly and is always present below the foreign body. With obstruction to its escape it increases in amount and may be forced out occasionally. Air may gain entrance as this occurs. Secretions frequently pass over to the bronchi of the other lung or to an unaffected lobe and cause

FIG. 7.

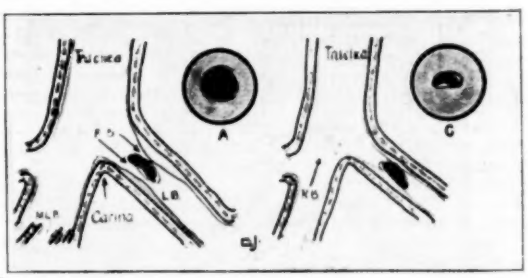


Diagram illustrating the mechanism which enables air to enter a bronchus but not to escape.

changes there. In some cases this is so marked that changes in the physical signs are found in the lower parts of the other lung. If the foreign body is a nut, which was being chewed at the time of aspiration, there is the possibility that small particles may have passed down to the side other than that which contains the largest portion. One point which is sometimes useful in diagnosis is the effect of atropine on the secretions. It may check the secretion so that the râles disappear entirely for a time and the character of the breath sounds can be more easily studied.

4. *Shifting of the Foreign Body.*—This is not very uncommon, and naturally confuses the signs and the diagnosis. The most frequent happening is that the foreign body is forced up into the trachea and remains there, or passes down into the bronchus of the other lung. The swelling of the mucous membrane persists for some days on the side first affected giving signs, while on the other side the foreign body causes changes. An example is as follows:—

Peanut in Bronchus.—A patient, aged 3 years, had been given candy which contained peanuts. She disposed of one piece, but with the second one she suddenly choked and became black in the face. The choking soon ceased, but dyspnœa and wheezing respiration persisted. Three weeks later the child was brought to the clinic with a temperature of 104° F., a pulse-rate of 140, and a respiration-rate of 40. The

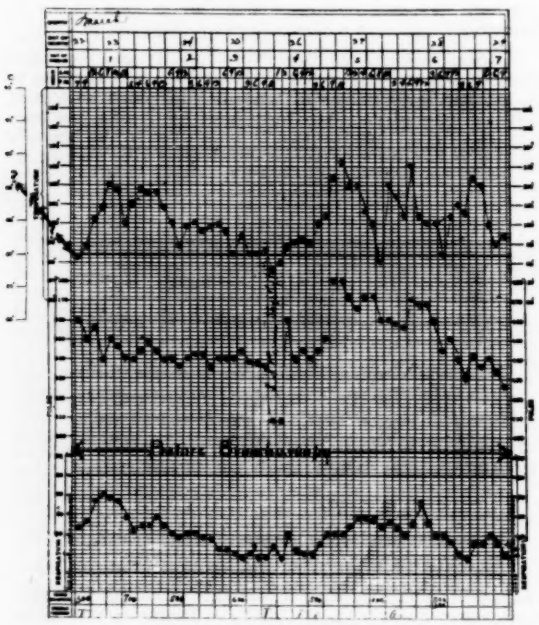
signs were in the lower right lobe. The other lobes on the right side and the left lung showed harsh breath sounds and an occasional coarse râle. The child was examined several times, and the signs were unchanged on the examination made just before bronchoscopy. On insertion of the bronchoscope by Dr. Jackson the child became very cyanotic. The *right* bronchus was found intensely inflamed and large amounts of pus appeared, but no foreign body could be found. The other side was explored and the peanut found in the *left* main bronchus. Dr. Jackson thought that the shift occurred with the introduction of the bronchoscope, and that this was responsible for the marked cyanosis. The place where the peanut had been on the right side was well marked by the local changes.

5. *The Results of a Previous Bronchoscopy.*—With the great development of bronchoscopy it is natural that some men may practise it who have not had sufficient training. One can imagine a man, who realises that his training is insufficient, perhaps thinking it is his duty to try and remove a foreign body if more skilled operators are a long distance away. Whether this view may be right or wrong, a certain number of patients are seen in whom trauma has resulted from previous bronchoscopy. This may add greatly to the difficulty of diagnosis, and time is usually required for the signs due to the bronchoscopy to subside.

6. The many possible variations in the relative amounts of air and secretion in the affected lung may cause great changes in the signs even from hour to hour. This renders it important to study the patients—if the diagnosis is difficult—for several days with frequent examinations. Special emphasis must be placed on the varying signs. On the one hand this is confusing, but on the other hand it is sometimes very helpful, especially if there is danger of mistaking the condition for pneumonia or empyema.

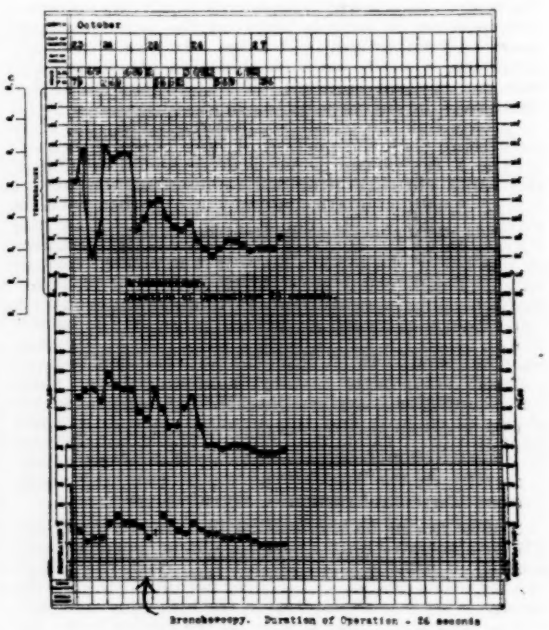
7. *Late Changes.*—These are not peculiar to foreign bodies. If the foreign body remains for a sufficiently long time a purulent process results and may lead to abscess formation. Bronchiectasis and fibroid changes are also natural sequences.

FIG. 8.



Temperature chart from a patient with a peanut in a bronchus. The drop in temperature (upper curve) occurred with a period of drainage. The rapid pulse and respiration rates (middle and lower curves) are marked.

FIG. 9.



Illustrating the rapid fall in temperature after removal of a foreign body. Pulse and respiration rates follow suit.

Symptoms.

The immediate symptoms due to the inhalation of the foreign body are very variable, as has been mentioned. There may be none or they are so slight as to escape notice both in adults and children. The following histories illustrate this:—

Atomiser Tip in Bronchus.—A man, aged 58 years, was troubled by cough which continued for some months, due, he thought, to his having "caught cold." He was told that many râles were present on both sides. A diagnosis of tuberculosis was made, although no tubercle bacilli were found. He went south for his health, but did not improve. Finally an X ray study was made, which showed a foreign body in the right lower lobe bronchus. On removal this was found to be the tip of an atomiser. He then remembered that 18 months before he had noted that the tip of his atomiser had been lost. He had no recollection of any disturbance which occurred at the time of aspiration.

As might be expected, the lack of any history of aspiration is not infrequent in young children. They may not realise that anything worthy of comment has occurred or many hesitate to expose their doings to publicity and perhaps punishment.

Umbrella Tip in Bronchus.—A boy, aged 8 years, was brought with the history that when 2½ years of age he suddenly brought up a mouthful of blood while eating a meal. An attack of fever followed, and the condition was diagnosed as broncho-pneumonia. There were repeated hæmorrhages and continued cough, but it was not until five years later that an X ray study was made and the metallic tip of an umbrella discovered in a bronchus. There was nothing to suggest the time of entrance. In another patient, a boy aged 7 years, there was a history of cough for

eight months, but no information could be obtained which gave any clue as to the time of aspiration. Examination showed a collar button in the lower right bronchus.

There is a great difference between the symptoms due to an irritant substance such as a nut and to a metallic structure such as a tack. The features of the former are discussed separately as they have special characteristics. In the majority of cases there is some disturbance at the time of aspiration, but this varies greatly in severity. The patients speak of choking and strangling, and the account in children is often of very severe disturbance accompanied by cyanosis. In many cases the account suggests that the object being in the trachea was responsible for the severity of the manifestations. The history often states that in a short time the symptoms decreased and the patient became comfortable, or there may have been paroxysms of cough for a few days. In some cases there are fever, cough, and rapid respiration, so that a diagnosis of pneumonia or influenza is often made. After this or without it there may be a period without symptoms. This often causes error, as it is supposed that there cannot be any foreign body present without distress. This quiescent period is responsible for many errors, and the frequency of its occurrence deserves special emphasis. Certain of the symptoms may be discussed in detail.

Cough.—This is usually present to some extent, but its occurrence may be irregular; sometimes it is in paroxysms. In small children it is often excited by movements or by crying. If an inflammatory process involves the upper air-passages or there has been trauma from a previous bronchoscopy, the cough may have a croupy character. So much has been learned from the bronchoscopic work of Professor Jackson regarding the factors which excite cough that some discussion of the whole subject is important, especially in the explanation both of its occurrence and of its absence.[3] The cough reflex may be entirely absent; this occurs most often in children and especially in toxic conditions. It is seen sometimes in old people with pneumonia. If an inflammatory process with secretion is present, marked accumulation results if the cough reflex is absent. The mucous membrane of the respiratory tract shows a marked tolerance to the irritation of a metallic foreign body after a few minutes of contact. Cough is excited if a bronchoscope is introduced into the right bronchus, but this subsides in a few minutes, and the tolerance remains until the instrument is brought into contact with new areas. If the bronchoscope is then introduced into the left bronchus and later reintroduced into the right bronchus the tolerance is found to have disappeared and cough is excited as on the first introduction. This explains certain of the clinical phenomena. For example, a foreign body which is fixed causes very little cough as compared with that resulting from a movable substance. In the former case tolerance is quickly established. This explains the frequent quiescent interval noted after the first period of cough following aspiration if the foreign body is not a plant substance.

Soon another factor comes into operation—namely, the reaction set up by the presence of the foreign body. In the case of a pin this may be very slight, but in the majority of cases there is local irritation with the production of secretion. The mechanism of the cough reflex will then be the same as in other conditions in which secretion occurs. There appears to be a difference due to the situation of the foreign body, and it seems that when it is far down in the bronchial distribution it excites less cough than if in one of the main bronchi. In one case a safety-pin remained for two months low down in the lung without exciting cough.

The influence of *secretion* is important. In almost all cases in which the production of pus occurs there is marked cough. It seems that when the foreign body is fixed the resulting cough is excited by the irritation and presence of secretion rather than from the foreign body itself. This is supported also by the fact that in cases in which the foreign body is a vegetable substance, such as a nut, and excites intense inflammation very rapidly cough results very quickly and is frequent in occurrence. The influence of secretion is also shown by the occurrence of cough in patients who have a foreign body in the œsophagus. This occurs with obstructive but not with non-obstructive œsophageal foreign body. In the obstructive cases there is an overflow of material (secretions and food) from the œsophagus into the larynx.

The tolerance of the larynx to the presence of foreign bodies is sometimes marked, and is well shown after intubation. A child aspirated a safety-pin into the larynx where it remained for three weeks. After the coughing and choking at the time of aspiration there was no cough. In two cases a cockle burr was aspirated into the larynx, and after a short period of choking and coughing the patients were free from cough. It may be said that very severe paroxysms of coughing when the foreign body is in a bronchus suggests that it is being moved about. Jackson concludes that there are no areas in the trachea or bronchi which are so specially sensitive as to deserve the designation of cough excitation areas; that tolerance is quickly established in all areas, and that the finer bronchial divisions show less cough production than the larger bronchi. The peripheral areas show no cough reflex unless *possibly* the pleura is irritated by pressure.

Dyspnœa.—This is rarely marked in bronchial cases with a metallic substance unless a main bronchus is blocked, secretions have passed over to the unaffected side, or the swelling of the mucous membrane has produced narrowing on one side and the foreign body has been shifted to the other side. The inflammatory reaction from bodies of an organic nature usually causes marked dyspnœa.

Pain.—This is rare, but in some cases the patient is able to localise the situation of the foreign body very accurately. In other cases they have been quite wrong, and have located the foreign body on the unaffected side of the chest from their sensations.

Fever is almost invariable at some time or other. (Figs. 8 and 9.) In many cases it comes on at intervals lasting for a few days or a few weeks, usually with an increase in cough and expectoration. In such cases the diagnosis of influenza or pneumonia is frequently made. With marked suppuration the fever curve may show wide variations. Slight continued or irregular fever is not uncommon.

[3] Chevalier Jackson: Cough: Bronchoscopic Observations on the Cough Reflex. Jour. Amer. Med. Assn., 1922, lxxix., 1399.

ELLA SACHS PLOTZ FOUNDATION.—This Foundation has been established in memory of Ella Sachs Plotz, of New York City, for the promotion of scientific investigation. The income from it is to be used under the following conditions: 1. For the present, researches will be favoured that are directed towards the solution of problems in medicine and surgery or in branches of science bearing on medicine and surgery. 2. As a rule, preference will be given to researches on a single problem or on closely allied problems; it is hoped that investigators in this and in other countries may be found, whose work on similar or related problems may be assisted so that more rapid progress may be made possible. 3. Grants may be used for the purchase of apparatus and supplies that are needed for special investigations, and for the payment of unusual expenses incident to such investigations, including technical assistance, but not for providing apparatus or materials which are ordinarily a part of laboratory equipment. Stipends for the support of investigators will be granted only under exceptional circumstances. The present available annual income is $10,000. Applications for support from this Foundation, accompanied by a full statement of the need for the investigation, the conditions under which it is to be prosecuted, and the way in which the grant would be expended should be forwarded to the Secretary of the Executive Committee, Dr. Francis W. Peabody, Boston City Hospital, Boston, Massachusetts.

LONGEVITY OF PARASITIC WORMS:

THE TERM OF LIVING EXISTENCE OF SCHISTOSOMA HÆMATOBIUM IN THE HUMAN BODY.

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LONGEVITY in biology is the term of living existence, without reference to its being a long or a short term or comparatively a long or a short term. The word needs definition because, being one about which dictionaries are not precise, its meaning is ambiguous. In an essay on comparative longevity, published about 1870, Ray Lankester[1] found it necessary to define its uses. Chalmers-Mitchell, in his Notes on the Theory of Longevity,[2] accepts Ray Lankester's definitions, and we cannot do better than accept them also.

Longevity: Normal and Potential.

Ray Lankester refers to "specific longevity" as the average span of life of the species, and "potential longevity" as the possible length of life of the individual. Specific longevity is the longevity of the species, the length of time a living being may expect to survive under natural conditions—the "expectation of life at birth." This is a problem of mathematics rather than physiology, is largely determined by accidents and external conditions, and does not interest us here. Potential longevity, on the other hand, depends on the inherent *vitality* of the individual. Accidents, diseases, and external conditions have no relation to it. It is said to be *normal* or *absolute*. If all untoward external conditions, diseases, and accidents could be eliminated, the animal surviving as long as his store of vitality lasts, no longer and no shorter, we should have absolute potential longevity, and the biologist could study longevity without any qualifications.

Absolute potential longevity is rarely if ever attained; we must therefore examine longevity as we find it, normal potential longevity, length of life under normal conditions. Although the subject of potential longevity has been much studied by philosophers and biologists, no great distance has been traversed, possibly because investigations have been limited in the main to man and the higher animals. The question as to why one animal lives longer than another is still without a satisfactory answer. Is there in truth any causative relation between high longevity and complex structure or mass? Has personal energy or generative expenditure anything whatever to do with potential longevity? Why is the distribution of "vitality" apparently so arbitrary?

Practically speaking, little is known of the potential longevity of the higher animals[3]; of that of wild animals nothing. Of potential longevity we know little concerning domesticated animals, and nothing concerning the uncivilised races of man, and we have only a life-insurance office knowledge concerning civilised man; accidental influences obscure the path of investigation, making progress by scientific methods impossible. Under such circumstances longevity can be dealt with mathematically but not biologically; in other words, specific longevity may be determined in the case of some of the higher animals, but it is difficult, if not impossible, to determine potential longevity.

More precise knowledge is obtainable of the potential longevity of some of the lower forms of life, and here the problem seems to be simpler. For instance, the plasmodium of malaria has a well-known term of existence in the human circulation[4] and the longevity of some of the parasitic trematode worms have been studied. Thus there appears a prospect of increasing the slender store of knowledge by the study of tissue and blood parasites in connexion with longevity, especially in such cases where external influences are reduced to a minimum—as, for instance, in fluke parasites of animals, where normal and absolute longevity approach each other more nearly than in other living things.

The Bilharzia Worm.

The potential longevity of the bilharzia worm in the human body is well worth attention. It is a tissue and blood parasite, and as such little subject to changes in environment, surroundings, or external conditions. G. M. Vevers,[5] in a review of the entozoa collected from animals which died in the Zoological Gardens of London during eight months in 1919, reporting a case of *Gastrodiscus ægyptiacus*, the trematode of equines in Africa, draws attention to the small amount of information we possess on the length of life of parasites of various groups in their hosts. (*Gastrodiscus ægyptiacus* is a species of parasite not altogether unrelated to bilharzia.) Dr. Vevers found this parasite in a Grevy's zebra which had been in the Gardens for six years. As it does not breed in the host, but requires an intermediary host to complete the life-cycle (*Cleopatra bulimoides*, a fresh-water snail), and as an intermediary host has not yet been reported in this country, the parasite must have been six years old at least at the death of the zebra. Further, as the zebra was in Hagenbeck's collection at Hamburg for three years previously we may fairly certainly assume that the potential longevity of *Gastrodiscus ægyptiacus* is at least nine years—probably longer. This is a long time for a parasite to live in the body of the host, and, as Dr. Vevers points out, the more remarkable in that the parasite lived in the intestines, where the vicissitudes of existence are greater and more numerous than in the blood or tissues. But remarkable as is this evidence of great longevity in a small living thing, it is not so remarkable as the long span of life of the bilharzia worm.

During the South African war many British soldiers contracted bilharzia disease. In 1920, 18 years after, many of the survivors, who had not been out of England and so could not have been reinfected, were passing live ova in the urine; in other words, some of the worms which the men had acquired in South Africa in 1902 were alive in 1920. The potential longevity of the bilharzia worm must therefore be 18 years. It is in point of fact longer. A well-known zoologist and doctor of medicine, living in England, contracted bilharzia in 1878, when he was 28 years of age, between the Limpopo and Zambesi rivers, whilst on a naturalist's expedition. He was probably infected in the Northern Transvaal on the borders of the Kala Hari river. He read a thesis on Endemic Hæmaturia in 1881, for which he obtained his M.D. degree, and became an acknowledged authority on bilharzia disease. Twenty-eight years after his return to England he was passing ova in the urine, which hatched out. He identified the ova himself under the microscope; the observation was confirmed by a well-known surgeon at Cambridge, who had often seen bilharzia ova, who made a note of the fact and informed the writer of this article. The patient had not been out of Europe in the interval, and had run no risk of reinfection by the parasite. How many years after the 28 he continued passing live ova I do not know; he did not bother about a disease which he had had for so long. I saw him in 1920 (42 years after infection), and found no ova in the specimen of urine which I examined, so 28 years must stand for the time being as the longest life of the bilharzia worm yet recorded. Possibly the potential longevity of the worm is longer; my friend wrote me in 1923 that he was of opinion that some of the worms still survived (45 years after infection) for he was still bothered by urinary irritability every year in August and September, which he humorously regarded

[1] On Comparative Longevity in Man and the Lower Animals, 1870. [2] Proc. Zool. Soc., 1911, I., 430.

[3] Ray Lankester's expression in 1870 was "profound ignorance."

[4] The longevity of the plasmodium of malaria may not be so simple as appears from this statement; it apparently may assume a spore form and lie dormant in the body for a long period.

[5] Proc. Zool. Soc., 1920, I t. III., 805.

as an indication that "Bill" was, as usual, taking the family to the seaside for the summer holiday.

With regard to the general question of the longevity of bilharzia worms, bilharzia, practically speaking, is always a multiple infection. We have counted at Khartoum as many as 450 worms in the portal vein of a case post mortem—each worm is a separate individual infection. There may be many strains of worms in the same human host, each strain having its own potential longevity. Some of the worms, no doubt, die each year, it being common experience, if no complications intervene, that symptoms improve with time. The weaker strains die first, and those with higher potential longevity live longer, it may be over 20 years, while a few live longer still.

The reason of the variability in the longevity of individual worms is an interesting question. Is it that different strains have arrived at various stages in their endeavour to adapt themselves to the span of life of the host? A tissue and blood parasite, subject to no adverse external influences to speak of, with no great changes in environment, no anxiety about food, &c., the only accident to which it is liable being the death of the host, would be more likely than another to live out its full span of life, fulfilling its destiny, and adapting itself to the span of life of its host more rapidly on this account. The longer-lived worms of the brood endowing their progeny with higher potential longevity than the shorter-lived, one might suppose the longevity to increase as generation succeeded generation. Bilharzia is an ancient disease in Egypt; it possibly originated there. It was prevalent about 1000 B.C.,[6] and the early papyri (Ebers) record a remedy for hæmaturia.

Relation of Longevity in Parasite and Host.

The worm having probably had time to adapt itself to the life-span of the host, one might expect parasites of a host with a shorter potential longevity than man to have a shorter potential activity than bilharzia worms. In the case of trematodes, cestodes, and nematodes [7] with intermediate hosts, when the patient has been moved from the focus of infection to a non-infected locality and the danger of reinfection eliminated, the longevity of the parasite can be studied with a fair amount of certainty, as we have an approximate date of infection and external harmful influences are reduced to a minimum. If certain parasites have potential longevity corresponding to the average longevity of the host, we might expect to find that the longevity of the bilharzia worm infecting cattle was of shorter duration than that infecting human beings.

It has been suggested to me that some of the diptera lay many eggs and have short longevity, and that parrots lay two eggs in about three years and have high longevity. Let these facts be admitted. It is not clear that the diptera die early because they lay many eggs, or that the parrot would live a shorter time if she laid more eggs. Bilharzia lays many eggs and has long potential longevity. If bilharzia did not lay many eggs the species would not be carried on—of the total number of miracidia hatched few have the chance to reach the intermediate host—but, on the other hand, one single miracidium piercing a snail may give rise to many cercariæ.

It seems to me that no conclusion can be drawn from these facts. There is a stranger thing to relate—namely, that the cercaria, the larval form of bilharzia, has a maximum longevity of about 28 hours as a free swimming entity, but when it pierces and penetrates the human skin it discards its tail and develops into the bilharzia adult worm having a potential longevity of 28 years. Can this be explained in general terms?

Conclusion.

To conclude, it seems clear that bilharzia worms have a long potential longevity, and do not conform to the conditions which Ray Lankester has laid down as favouring longevity. Their *individuation* is not high, their structure is not complex or their bulk large. They display considerable energy throughout their (frequently) long life, traversing the portal veins between the liver and bladder (or rectum). Their generative energy is great, commencing early and continuing through life; they deposit enormous numbers of eggs.

It is probable that the study of the life-history of living things shorn of most of the obscuring and overwhelming external conditions of environment will bring us nearer to fundamental principles which apply to more complex and more developed organisms and lead to a revision of our present conclusions regarding potential longevity.

[6] Ruffer, M. Armand: Note on the Presence of Bilharzia Hæmatobia in Egyptian Mummies of the Twentieth Dynasty (1250–1000 B.C.), Brit. Med. Jour., 1910.

[7] In the Ministry of Pensions tropical clinic the following case recently occurred showing the longevity of filaria: An Englishman was infected with *Filaria loa loa* in West Africa. He was placed under observation in 1918 and his peripheral blood was at intervals examined, but it was not until 1922 (6¼ years after he first noted the swellings (Calabar)) that embryos occurred in the blood-stream. As *Filaria loa loa* requires an intermediary host to carry on the species not found in England, and as the man had not been out of England since 1915 he could not have been reinfected, we must conclude that the filaria worm producing the embryos arrived at maturity after 6¼ years. It will be interesting to know what the potential longevity of *Filaria loa loa* is. The infection has already existed for nine years (1924) in the case quoted.

IDIOSYNCRASY TO ADRENALIN,

WITH REFERENCE TO ITS EMPLOYMENT WITH LOCAL ANÆSTHETICS AND IN GOETSCH'S TEST FOR HYPERTHYROIDISM.*

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AT the joint meeting of various Sections of the Royal Society of Medicine on cocaine substitutes, as reported in THE LANCET of Dec. 15th, 1923, adrenalin, which is often given with drugs of this class, received little notice when toxic effects were being reviewed. Adrenalin is not a cocaine substitute, and it was not, strictly speaking, under discussion. It seems, therefore, a suitable time to consider its toxic effects.

The Employment of Adrenalin with Local Anæsthetics.

The following instance of the occurrence of disquieting symptoms after the injection of novocaine and adrenalin for the extraction of teeth has recently come to my notice. Incidentally, the patient gave a positive reaction to Goetsch's test for hyperthyroidism, though the dentist did not have this test in view when making the injection.

A married woman of average nervous stability, aged 38, had novocaine and suprarenin injected into the gum by Mr. S. D. Corbett for the extraction of two lower incisor teeth on July 2nd, 1923, and the following symptoms appeared almost immediately after the injection: limpness and chilliness, succeeded by mental agitation, severe palpitation, rapid panting breathing, flushing of the face, and tremor of the arms and legs. The pulse was feeble. There was no nausea and the brain remained clear. A few minutes later, the severity of the symptoms having abated, the teeth were removed. On getting up there was difficulty in standing. Recovery was uneventful, and the patient was in her usual health the following morning. The doses of the drugs injected were 0·03 g. (½ gr.) of a 2½ per cent. solution of novocaine and 0·00003 g. of suprarenin—an amount equal to ½ a minim of a 1 in 1000 solution of adrenalin chloride, at a strength of 1 part in 40,000.

Dixon [1] states that suprarenin, which is synthetic adrenalin, has only half the toxicity of the natural variety, so the appearance of toxic symptoms in this case, following, as they did, so small a dose, is the more striking. On inquiry, it transpired that the patient had experienced similar, though less marked, symptoms several times previously in similar circumstances. Their greater severity on this occasion may be attributed to the fact that she was at a lower level of health at the time.

* Based upon a paper read before the Royal Society of Medicine (Section of Therapeutics and Pharmacology) on April 8th, 1924.

The symptoms might be explained on the assumption that the drug was injected into a vein—intravenous injection of adrenalin being 40 times more dangerous than subcutaneous [2]—but this contingency is excluded here, as the patient had had similar experiences before. When troubles are recorded in the literature in connexion with the use of novocaine and adrenalin for tooth extraction, one cannot always be sure that neurosis, or some other cause, has not played a leading part in their production. On the other hand, patients actually presenting mild toxic effects have, no doubt, been diagnosed as showing manifestations of neurosis. I may, however, draw attention to a case, recorded by Parfitt,[3] in which novocaine and adrenalin were injected for tooth extraction, which presented symptoms strikingly resembling those of the case detailed above; and to another, published by Pedley,[4] in which death occurred in similar circumstances.

But grave toxic symptoms following the use of small doses of adrenalin in dental practice are not common, for Mr. F. N. Doubleday, at the meeting of the Royal Society of Medicine above referred to, stated that he had used novocaine and adrenalin in hospital practice for 16 years without serious ill-effects.† Nevertheless, it is recognised that adrenalin is liable to cause disquieting symptoms, even in small doses, unless used in dilute solutions, for Blomfield [5] writes: "Adrenalin, if injected in too strong solution, easily causes a feeling of oppression in the chest and palpitation." Blomfield [5] further states that "the local ischæmia produced by adrenalin follows the use of solutions as weak as 1 in 200,000." In view, therefore, of the existence of individuals with an idiosyncrasy to adrenalin, it would appear that dentists might, without sacrificing efficiency, use a solution of a strength of 1 in 100,000 to 1 in 200,000 instead of one of 1 in 20,000 to 1 in 40,000. At all events, it would seem to be desirable for them to inject a small and dilute dose when operating on a patient for the first time, and, if an idiosyncrasy is found to exist, to advise a general anæsthetic on future occasions.

To turn to less minute doses, A. F. Hertz[6] gave himself a subcutaneous injection of 3 minims of a 1 in 1000 solution of adrenalin, and describes the results as follows: "I felt extremely ill for some minutes, my hands shook so much that I could hardly put the syringe away, and my pulse became very rapid." And Braun[7] gave himself a subcutaneous injection of 7·5 minims of a 1 in 1000 solution of suprarenin with the following results: A sense of oppression in the chest came on in five minutes, and the breathing became deeper and more rapid. Palpitation followed, the pulse increasing from 64 to 94 per minute, and he had to lie down. The symptoms lasted for one and a half minutes.

With still larger doses, such as those used in surgical practice, the danger of toxic symptoms is proportionately greater, and I would suggest that it is desirable to test the susceptibility of the patient by giving a preliminary dose, smaller than the one which it is intended to use at the operation, in all cases in which it is proposed to employ adrenalin in conjunction with a local anæsthetic. This remark has particular cogency in connexion with operations which are not essential. In conditions in which hyperthyroidism is known to exist, such as Graves's disease, even of mild grade, adrenalin would appear to be contra-indicated.

I may here cite particulars of a fatality which occurred at a London hospital after the injection of adrenalin in the case of a patient with Graves's disease, on whom it was intended to operate. The particulars were related to me by one of the authorities concerned, and are transcribed from notes made at the time.

The patient was a woman of 28, with slight symptoms of Graves's disease and a goitre of considerable size. She was not nervous or apprehensive, the reason for the operation being her desire to have the tumour removed to improve her personal appearance. At 9.15 A.M. omnopon, gr. ¼, scopolamine, gr. 1/100 and atropine, gr. 1/120 were injected, but took only slight effect, the patient not becoming drowsy. At 10.15, 65 c.cm. of a ¼ per cent. novocaine solution, and a little more than 2 c.cm. (37 minims) of a 1 in 1000 adrenalin chloride solution were injected into and under the skin of the neck, there being no evidence of the piercing of a vein. No ill-effects were noticed till 10.27, when she vomited. At 10.30 the face had become blue, the corneæ insensitive, the pupils dilated, and the breath gasping, and the pulse was only just palpable. Shortly afterwards respiration ceased, and the pulse became imperceptible. There was no response to oxygen insufflation, caffeine injection, or artificial respiration; and only a flutter was elicited by the hand when the heart was massaged through an abdominal incision.

This case shows the sledge-hammer effect of a large dose of adrenalin, when hyperthyroidism is present, and it does not, therefore, present the typical reaction associated with small doses.

The question may be asked: could not the symptoms manifested in the various cases mentioned be produced by the novocaine and not by the adrenalin? The two following considerations are opposed to this view: (1) The similarity of the picture to that following Hertz's and Braun's experiments on their own persons with adrenalin—to which attention has already been called—and also to that of a positive reaction to Goetsch's test, to be shortly described. (2) The low toxicity of novocaine. This drug has been found experimentally to be the least toxic of local anæsthetics.[8] Braun states that he has never noticed any disturbance resulting from a subcutaneous injection of a 2 per cent. solution of novocaine, and that he has been in the habit of using between 100 and 200 c.cm. of a 0·5 per cent. solution, together with small quantities of a 1 per cent. solution, repeatedly giving as much as 250 c.cm. (1·25 g.), and he quotes instances of large doses injected by others. Though he mentions several cases in which death followed the use of novocaine, he considers that other causes would account more naturally for the event in each instance. The fact that such large quantities of novocaine can be employed with impunity, if a dilute solution is used, suggests that, in addition to the initial one, further injections might be made as an operation proceeds. If this is so, the localising effect of adrenalin may not be so necessary as has been thought, and it may be possible largely to dispense with the drug for this purpose.

Certain observations on the blood pressure of anæsthetised animals by Sternberg [9] also tend to discourage the use of adrenalin in association with novocaine. These observations show that the action of adrenalin‡ is increased, as compared with its action on animals used as controls, as a result of giving even small doses of cocaine, alypin, or novocaine. The sensitising effect of novocaine was, however, much more transient than that of cocaine or alypin.

Goetsch's Test.

Goetsch's test, which is used to differentiate hyperthyroidism from certain functional nervous disorders and from early tuberculosis, may be described as follows: 7·5 minims of a 1 in 1000 solution of adrenalin chloride are injected subcutaneously. The blood pressure and pulse-rate are taken before the injection, and every few minutes after it, for a period of one and a half hours. A positive result consists in a rise of at least ten points in both blood pressure and pulse-rate during the first quarter of an hour, together with heart consciousness, asthenia, a feeling of dread, tremor, pallor, and flushing, and some sweating. Goetsch [10] was led to elaborate this test after collating the results of certain experiments on animals by various workers, from which he concluded that an increased sensitiveness to adrenalin, on the part of the sympathetic nervous system, exists in the presence of an increased amount of thyroid secretion in an organism; and that, by virtue of this sensitising action on the sympathetic system, a sudden increase

† He uses 0·02 g. novocaine and 0·0005 g. adrenalin in 1 c.cm.—i.e., at a strength of 2 per cent. and 1 in 20,000 respectively.

‡ Sternberg injected the adrenalin intravenously, and at a strength varying between 1 in 200,000 and 1 in 1,000,000.

of adrenalin in the circulating blood should call forth active responses throughout that system. He considers that the most frequent cause of this condition of increased activity of the sympathetic is hyperthyroidism. Whatever the theoretical basis may be, there is little doubt that adrenalin produces the results claimed in cases of hyperthyroidism. Goetsch himself obtained a positive response in cases of Graves's disease and in adenoma of the thyroid, and McBryer [11] has published a series of observations pointing in the same direction.

Goetsch writes: "In no case were dangerous symptoms observed after the dose of adrenalin which I used," and he goes on to say that it is not until twice the dose is reached that mild symptoms are produced in normal individuals. In view of the various experiences narrated above, it is difficult to avoid the impression that Goetsch and certain other writers on the subject have been fortunate. Although grave symptoms may be rare, one cannot be sure how near a case, apparently presenting mild toxic effects, may be to the borderline dividing the harmless from the dangerous. But even if grave symptoms could be excluded, the manifestations constituting a positive reaction to the test, though not in themselves necessarily serious, might produce, in the case of nervous patients, psychological effects causing undesirable results of a permanent character. McBryer performed the test on a series of individuals. The series was made up of normal and tuberculous persons, some of the latter being known to have hyperthyroidism. In every case of this series tremor and nervousness were produced or increased, and in those which were known to have hyperthyroidism the pulse became "irregular, unequal, and varied in volume." Probably few physicians would agree to their patients being subjected to the test if they were aware that it is liable to produce such results as these, unless the diagnosis was impossible by other means.

As to the rôle of Goetsch's test in differentiating between hyperthyroidism and early tuberculosis there are other methods available for the purpose, and the test may therefore be regarded as a luxury. The only tuberculous cases in which, in my experience, the differential diagnosis has been doubtful have been those with acute pulmonary tuberculosis in an early stage, when the progressive nature of the lesion has rapidly decided the point. Owing to lack of experience in the diagnosis between hyperthyroidism and "certain functional nervous disorders," I am unable to give an opinion as to whether the advantages to be expected from the test in this type of case are commensurate with the inconveniences and risks entailed.

Conclusions.

That some people show toxic effects, as a result of receiving a small dose of adrenalin, and that these effects are increased if certain local anæsthetics are given simultaneously.

That toxic manifestations from adrenalin might be eliminated in dental practice if dentists were to avoid stronger solutions of this drug than 1 in 100,000.

That surgeons might escape such manifestations by giving a preliminary injection of a smaller dose of adrenalin than that which it is proposed to employ at the operation; and, in the event of an idiosyncrasy to adrenalin being found to be present, by employing a general anæsthetic.

That it is preferable to use synthetic adrenalin rather than the natural product.

That the use of adrenalin is contra-indicated when operating on patients with Graves's disease.

That the practicability of using large quantities of a dilute solution of novocaine may render it possible to discontinue the use of adrenalin with this local anæsthetic.

That Goetsch's test should only be employed when the diagnosis cannot be established by other means; and that, if it is decided to make the test, a smaller dose should be given first, as suggested in the case of projected surgical operations.

(*Continued at foot of next column.*)

MEASUREMENT OF ULTRA-VIOLET LIGHT

BY MEANS OF AN ACETONE METHYLENE-BLUE SOLUTION.

BY A. WEBSTER, F.C.S.;
LEONARD HILL, M.B. LOND., F.R.S.;
AND
A. EIDINOW, M.B., B.S. LOND.

(*From the Department of Applied Physiology, National Institute for Medical Research, Hampstead, N.W.*)

THE first essential in the proper use—as a means of treatment—of sun radiation or that of artificial sources is an accurate measurement of dosage. The dose is the product of intensity and duration. It has been shown that it is the ultra-violet radiation which is active in producing biological action, such as erythema followed by pigmentation of the skin, prevention of rickets in animals and children on a deficiency diet, and cure of lupus and other tuberculous lesions. Infra-red rays by themselves have no lethal action other than that of heat, as is shown by the fact that if infusoria, microbes, or the human skin be kept cool—e.g., by irrigation—infra-red rays have no effect. Both these and visible rays, in so far as they heat the living cells, quicken the lethal action of ultra-violet rays.

While the biological action of the ultra-violet rays is thus quickened by coincident infra-red and white light, there is some evidence that, at any rate in the case of the mercury-vapour lamp, it is somewhat delayed in cool conditions by a coincident pencil of red-yellow rays. The chief artificial sources of ultra-violet rays are the carbon arc and the mercury-vapour lamp. Metal cores are introduced into a carbon pole to increase the ultra-violet radiation and biological activity of the arc. Tungsten has been used, but we find the cheaper aluminium cores to be more active. The spectrum of tungsten is credited with no lines shorter than 3965 Angström units, while that of aluminium extends to 2263 and iron to 2332. That of iron is particularly rich in lines about 3000, which is the length of ray most active in producing erythema of the skin. The ordinary "white light" carbon is itself not far behind the metal-cored ones, and is quite active enough for general use. The carbon arc is rich in visible and heat rays, but not so rich proportionately in visible rays as the high sun. The mercury-vapour lamp (M.V.L.) is richer in ultra-violet rays, and gives off much less heat and less visible rays than the carbon arc. In the Cooper Hewit M.V.L. the arc is made in a vacuum, and the intensity of this lamp falls off as the vacuum becomes lessened with time. In the Kelvin, Bottomley, and Baird M.V.L. there is no vacuum, and the same disadvantage does not occur, but deterioration takes place slowly. It is necessary that the intensity of the M.V.L. should be tested from time to time, and that of the carbon arc measured before treatment is given. As the intensity varies as the square of the distance from the source,

IDIOSYNCRASY TO ADRENALIN: REFERENCES.

(*Continued from previous column.*)

1. Dixon, W. E.: Manual of Pharmacology, fifth edition.
2. Batelli, cited by Braun, H.: Local Anæsthesia, English translation, 1914, p. 144.
3. Parfitt, J. B.: British Dental Journal, 1910, p. 381.
4. Pedley, J. K.: Brit. Med. Jour., 1910, ii., 2052.
5. Blomfield, J.: Anæsthetics in Practice and Theory, 1922, p. 363.
6. Hertz, A. F.: Brit. Med. Jour., 1914, i., 965.
7. Braun, H.: Local Anæsthesia, English translation, 1914, pp. 124–5.
8. Eggleston, C. and Hatcher, R. A.: Journal of Pharmacology and Experimental Therapeutics, 1919, p. 433.
9. Sternberg, H.: Archiv f. Experimentelle Pathologie und Pharmacologie, 1923, p. 112.
10. Goetsch, E.: Newer Methods in the Diagnosis of Thyroid Disorders, New York State Journal of Medicine, July, 1918, p. 259.
11. McBryer, R.: American Review of Tuberculosis, 1920–21, p. 616.

very different dosages may be given, and either uselessly small, or harmfully large, reactions produced if the dosage is not measured beforehand.

The sun varies enormously with its height in the sky and with clarity of atmosphere, amount of cloud, &c. A gauge is required both to test the strength of the sun before dosage and to measure the dosage given day by day. Seeking for a gauge of ultra-violet rays, based on biological action, we first began by trying the bleaching of various solutions of protein and methylene-blue, and then turned to a solution of acetone methylene-blue as simpler and cleaner and having a suitable absorptive power.

A solution of acetone in water is decomposed by ultra-violet light with the formation of acetic and formic acids and other substances. We first used the increase in pH of a watery solution of acetone exposed to a source of ultra-violet light as a measure of the intensity of the light, and in the laboratory this gives satisfactory results. It needs, however, some care in measuring quantities of solution and indicators used, and is not simple enough for general use. The decomposition of aqueous acetone by light is partly an oxidation process, and it was thought likely that reduction processes were taking place at the same time, and that these might be measured by means of the reduction of methylene-blue. This proved to be the case, the bleaching of the methylene-blue being proportionate to the time of exposure. Methylene-blue evidently acts as a hydrogen receptor in the complex oxidation and reduction processes going on in the mixture. Mr. F. Smiles investigated for us the absorption of the spectrum of the iron arc by a 30 per cent. solution of acetone in a quartz container in a layer 3 mm. thick, and by this, and by our acetone methylene-blue solution in like thickness, all rays shorter than 3600 A.u. were absorbed. The shortest visible rays are about 4000 A.u., and the shortest ultra-violet which penetrate air about 2000 A.u. The standard acetone methylene-blue is made up from a 0·1 per cent. solution of Paulenc Fréres methylene-blue; 5·8 c.cm. of this is added to 30 c.cm. of acetone and made up to 100 c.cm. with water; this gives a standard labelled (10).

Older Methods.

The older methods[1] which have been employed are (1) the iodine method of Bering-Meyer[2]; (2) the Eder photometer; (3) the photo-electric cell of Elster and Geitel used by Dorno; (4) the chron-actinometer of Bordier; (5) the silver-citrate method of Victor Henri; (6) the aktinimeter of Fürstenaus. The Bering-Meyer method depends on the setting free of iodine out of an acid solution of potassium iodide. The iodine set free by radiation is found by titration with a solution of sodium thio-sulphate, or determined colorimetrically.

Keller[3] has modified the Bering-Meyer method by mixing solutions of sodium thio-sulphate, acid potassium iodide and starch, and finding when a blue colour just begins to appear. He uses a mixture of 25 c.cm. of 1 per cent. potassium iodide solution and 25 c.cm. 5·3 per cent. sulphuric acid solution and starch, and 1 c.cm. of 1/400 n. sodium thio-sulphate solution, and using two mercury-vapour lamps, gets good agreement between the reading of this gauge and the amount of erythema of the skin produced by either lamp. One disadvantage of this method is the instability of the solution. The reaction also comes off under a glass screen and is a measure, not of ultra-violet rays, but of these and visible rays.

The Eder[4] photometer is one with a wedge of gelatine of increasing greyness with a scale printed beneath it. Sensitive paper of a standard make is placed beneath the wedge in a frame and exposure of the wedge made beneath a suitable roughened glass which diffuses the light and prevents reflection (Dorno). The extent of the scale printed off on the paper is read. This is a measure of shorter visible and ultra-violet rays. In the Bordier actinometer[5] there is a scale of coloured papers with which is compared a piece of blotting paper first dipped in 20 per cent. potassium ferrocyanide and then exposed to light. We have tested this method under quartz and under glass screens. That under quartz colours the quicker, but the reaction is very slow—e.g., exposed to 25 amp. arc, slight coloration occurred in 90 minutes—while an erythema of the skin followed a 15 minutes' exposure, and the acetone methylene was bleached 1·0 on our scale by an exposure of one hour.

The aktinimeter of Fürstenaus[6] depends on the increase of electrical conductivity of selenium on exposure to light. Victor Henri[7] investigated the following methods for gauging ultra-violet:—

(1) Dissociation of pure and dry HCl.

(2) Decomposition of H_2O_2 in pure H_2O. This is made ten times slower by a glass screen 1 mm. thick in front of the M.V.L., the glass cutting off the shorter ultra-violet rays.

(3) Decomposition of cane sugar and increase of H-ion concentration measured by the physical method. The glass screen slows this 15 to 20 times.

(4) Decomposition of KI in the presence of H_2SO_4. The glass screen slows this 4 to 5 times.

(5) Decomposition of paper moistened with silver citrate. The glass screen slows this 8 times.

(6) Sterilisation of *B. coli* emulsion, 100 c.cm. in a porcelain capsule 6 cm. in diameter placed 20 cm. from M.V.L. The glass screen slows the sterilisation 1000 to 2000 times.

We find that the silver citrate paper exposed to the 25 amp. arc blackens almost as quickly under glass as under quartz. It measures visible and ultra-violet rays. The rays which have the most active biological action on the skin are the middle ultra-violet ones, those at and just on either side of 3000 A.u.[8] These are the shortest rays present in the high sun on clear days, which particularly produce sunburn and pigmentation. Longer ultra-violet rays of equal intensity do not have so great a biological action, but these act on the skin when sufficiently intense in arc or high sun. Shorter ultra-violet rays do not penetrate to the deeper cells of the epidermis, and so while very powerful in killing unicellular organisms into which they penetrate, have little or no action on the skin. Comparing the bleaching of acetone methylene-blue with the action on infusoria in quartz tubes and on the human skin we find a general agreement. In the case of the M.V.L. it takes twice as long to bleach our standard acetone methylene-blue solution one point in our scale as to kill infusoria, or to produce an erythema in the skin equal, on the Lovibond tintometer scale of coloured glasses for skins, to 1·0 yellow plus 1·5 red. In the case of the carbon arc longer ultra-violet and the heating effect of infra-red and visible rays so increase the biological action of the middle ultra-violet rays that the bleaching time for acetone methylene-blue one point in the scale becomes four times as long as that of the above biological reactions. In the case of the autumn and winter sun the bleaching time appears to be twice as long as that for producing the biological reactions; we have not yet had opportunity of investigating the high spring and summer sun.

Details of Method.

Preparation of Standard Acetone Methylene-blue Solution and Standard Quartz Tube.—Take two parts of the standard methylene-blue solution and add one part of acetone and mix. This is the solution used for filling the standard quartz tube. The mixed solution very gradually fades and must be kept in a stoppered bottle in a cool dark place. The standard quartz tube is one with internal diameter of 3 mm.

Instructions.—Fill quartz tube to within ¼ in. of top and close tube with rubber cap, place it against

[1] Keller: Strahlentherapie, 16, 1923.
[2] Strahlentherapie, 1, 1912.
[3] Strahlentherapie, 16, 1923.
[4] Strahlentherapie, 10, 1920.
[5] Supplied by Cooper Hewit, Ltd.
[6] Strahlentherapie, 12, 1921.
[7] Compt. Rend., Acad. Sci., 1911, cliii., 265.
[8] Hausser and Vahle: Strahlentherapie, 13, 1923.

the standard tubes and determine its strength, and then expose to sun or source of radiant energy. By determining the strength of tint before exposure errors due to fading or refractive power of the quartz tube are avoided.

Exposure.—The tube is exposed in an open space that is not shaded in any way from the sun, and is best placed horizontal and with the length of the tube facing zenith.

Time.—In winter, in Britain, the tube can be exposed from 9 A.M. to 9 A.M., and the reduction for the whole day determined. In spring and summer on sunny days the time of exposure may have to be shorter, from, say, 10 to 4, the time during which heliotherapy goes on. In the Alps, where cool early morning hours and less powerful sun are used for treatment, the intensity in these hours would be measured. At the end of the exposure compare the colour in the quartz tube with the colour of the six standard tubes. The standard tubes are marked 3, 4, 5, 6, 7, 8, 9, and are placed in a suitable frame for comparison.[9] If by any chance the sun is so strong as to completely bleach the acetone methylene-blue solution, then the time of exposure must be shortened.

When comparing the exposed tube with the standards hold the tubes at an angle of 45 degrees against the white paper background. Each standard tube is sealed up after the introduction of the watery solution of methylene-blue, which for tropical countries is suitably "buffered" with phosphate salt so as to prevent any alteration of alkalinity and colour of the solution through the prolonged contact with glass in warm atmospheres.[10] After filling the quartz tube, it is advisable to polish it on the outside with a clean piece of cotton—i.e., a soft handkerchief. Any grease or dirt on the outside will stop the ultra-violet rays from penetrating into the solution.

On a clear day the blue sky reflects and scatters much ultra-violet light: white clouds also give these rays. The total ultra-violet from the blue sky is greater than that from the high sun, and much greater than that from the low sun (Dorno). On clear days the sun and sky together produce the result. On cloudy days the intensity of the ultra-violet rays from the sky are measured. Notes of the conditions at the time of exposure are useful: the height of the sun above the horizon, clear or cloudy sky, &c., temperature of air, black fur temperature, and cooling power determined by the kata-thermometer.

In measuring the intensity of lamps the quartz tube is placed vertically—i.e., at right angles to the lamp—and on the same level as it. In measuring the treatment of any particular case, the quartz tube can be placed at the same distance from the lamp as the body, and exposed for the same time as the patient. A rise in temperature of 10° C., say from 15° to 25° C., accelerates the bleaching and makes the reading about 0·6 too high. A correction can be made then for temperature, but as warmth also accelerates the action of ultra-violet rays on the skin so far as concerns treatment, this is unnecessary.

Examples of Results.

Commander Dudding, of the *Hood*, wrote: "I got no reading from my quartz tubes daily exposure two hours (1200 to 1400) until we got to the Cape, lat. 25° S., 12° E. When I got '6' at the same time, men's arms and legs showed red sunburn for the first time." Off Sierra Leone the climate was hot, muggy, uncomfortable—dry bulb 81 and wet 81, dry kata-thermometer 2 and wet 13, but neither sunburn nor bleaching of the blue occurred.

At a distance of 2 feet from a 25 amp. carbon arc the acetone-blue solution was bleached 1 degree in the scale in just about one hour. The Kelvin, Bottomley, and Baird mercury-vapour lamp produced the same change in about 30 minutes at 1½ feet. A 15 minutes' exposure of the body to either lamp produced an erythema of that moderate intensity indicated by the Lovibond tintometer as given above.

Exposing the quartz tube from 9 A.M. to 9 A.M. on days in January (1924) at Hampstead, the bleaching is less than 0·5 on cloudy days, 1½ on fine days, and 2½ on an all-sunny day. At Peppard Common Sanatorium, Oxon (Dr. P. Tozer, observer), the bleaching on some days may be greater by 50–100 per cent. than that at Hampstead, owing to the absence of smoke pollution there.

[9] The apparatus is made by Siebe Gorman, Ltd., 187, Westminster Bridge-road, S.E.

[10] A special order should be given for these tropical standard tubes.

MASSIVE DOSES OF DIGITALIS IN AURICULAR FIBRILLATION WITHOUT HEART FAILURE.

BY JULIUS JENSEN, M.R.C.S. ENG.,
RESIDENT MEDICAL OFFICER, THE MINISTRY OF PENSIONS HOSPITAL, ORPINGTON, KENT.

FOR some years digitalis has been administered in larger doses than was customary before Sir James Mackenzie's observations on its use in auricular fibrillation. But with these larger doses of 1 to 1½ drachms of the tincture a day there remains the disadvantage that beneficial effects are not demonstrable until after the third day of administration. In 1916 Eggleston proposed to use a dosage far in excess of that indicated in the British Pharmacopœia, and to give three large doses at six-hourly intervals, and then no more for a time.[1] He claimed to be within the limits of safety in cases where there are no contra-indications to a full digitalis effect, and at the same time to obtain this effect much more rapidly than by the current method of administering this drug. Since the original communication of Eggleston several papers have appeared on this subject, and these have recently been reviewed by him.[2] In this country Eggleston's method has been advocated by Prof. F. R. Fraser,[3] who used it in cases of severe heart failure.

In the following observations the effect of large doses of digitalis has been studied with a view to obtaining information of its pharmacological effect upon the heart-rate, the excretion of urine, and the production of vomiting in cases of auricular fibrillation without obvious failure. The patients were under the care of Dr. John Parkinson in the cardiac wards of the Ministry of Pensions Hospital, Orpington. They were middle-aged males with mitral stenosis and auricular fibrillation. All were dyspnœic on exertion, and some also complained of pains about the left breast. None were actually in a state of failure at the time of observation; they were able to walk about without distress, there was no dyspnœa when at rest, no œdema of the feet, and no enlargement of the liver. Some gave a history of occasional and slight swelling of the feet, and two of them had slight enlargement of the liver on admission.

Method of Observation.

If the patient was under the influence of digitalis on admission, he remained without medicine for at least 14 days. At the end of this period his pulse was usually smaller and more rapid. He was then confined to bed, and the apex-beat was repeatedly counted with stethoscope and charted. The urine was measured six-hourly, and the patient was observed in this way for three to four days before any drug was administered. On the morning of the day of administration he was again examined, and the absence of signs of failure confirmed. One or one and a half drachms of a standardised tincture of

[1] Eggleston: American Journal of Medical Sciences, 1920, clx., 625.

[2] Eggleston and Wyckoff: Archives of Internal Medicine, 1922, xxx., 133.

[3] Fraser, F. R.: THE LANCET, 1922, ii., 703.

digitalis was then administered; six hours later the second dose—1 drachm—was given, and six hours later still the third and last dose, another drachm. The apex-beat was frequently counted and the urine measured six-hourly as before. The observations were continued in the same way for five days subsequent to the day of administration. The whole of this procedure was repeated after the lapse of a fortnight so as to furnish a second and controlling experiment.

Table showing Effect of Digitalis on Heart-rate and Urinary Output.

Case.	Age.		Heart-rate at—		Rise or fall.	Amount of urine—		
			9 A.M.	9 P.M.		Day before.	Digitalis.	Day after.
1	38	(*a*)	90	72	−18	84	71	52
		(*b*)	80	70	−10	70	45	58
		(*c*)	110	85	−25	54	86	34
2	47	(*a*)	115	85	−30	42	65	80
		(*b*)	105	95	−10	55	57	50
3	50	(*a*)	95	105	+10	62	56	63
		(*b*)	84	94	+10	66	79	82
4	43	(*a*)	128	130	+ 2	42	35	31
		(*b*)	95	104	+ 9	67	24	42
5	28	(*a*)	66	63	− 3	32	44	41
6	40	(*a*)	100	91	− 9	44	32	50
		(*b*)	100	76	−24	53	36	41
7	31	(*a*)	92	90	− 2	52	33	32
		(*b*)	140	115	−25	68	64	92
	Average		102	92	−10	56·5	52	53·4

Results in seven cases of auricular fibrillation free from failure. (*a*), (*b*), and (*c*) indicate separate experiments. The heart-rate is reduced on the day of administration in five out of seven cases; the urinary output is unaffected.

Results.

Effect on Heart-rate.—The heart-rate was in most cases affected to some extent on the evening of the day of administration, about 12 hours after the first dose had been given, and the average fall in rate by this time was ten beats per minute. This fall was maintained the next morning, and later on in that day a further fall of ten beats per minute occurred, though no more digitalis had been given. The

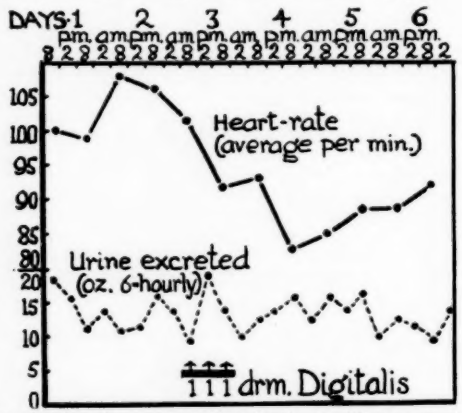

Chart showing the average heart-rate (continuous line) and amount of urine excreted (interrupted line) before and after digitalis.

quality of the pulse was much improved, the volume being larger. In a few cases coupled beats appeared temporarily. This control of rate, however, was not very stable, as counts taken after meals or after slight exertion or excitement nearly always showed that the pulse had risen towards its original rate. Very often, also, there was a relapse lasting for a few hours without any apparent cause. The total duration of the effect was from four to 14 days.

Effect on Urinary Output.—Digitalis had no definite diuretic effect on any case; this observation confirms the general view that digitalis exerts little or no diuretic effect (even in large doses) unless œdema, obvious or masked, is present. The chart does seem to indicate an increase, amounting to 4–6 oz. during the six hours following the administration of the first dose of digitalis, but there was no increase in the total daily amount, either on the same or on the following day.

Effect on Symptoms and General Condition.—The patients all felt better and said that they had less palpitation. As all signs of failure were absent in the cases observed, there was no opportunity of judging the effects of digitalis on this condition.

Absence of Vomiting.—Apart from occasional coupling of the pulse in two cases there were never any indications of overdosage. Nausea and vomiting were never seen—a fact of special interest, tending to show that the vomiting which sometimes occurs early in the administration of digitalis in heart failure depends far more upon the failure of the heart than upon any irritant effect of this drug on the stomach.

Clinical and Laboratory Notes.

A CASE OF FIBROMYOMA OF THE STOMACH.

BY J. E. G. CALVERLEY, C.M.G., M.D., B.S. LOND.

THE following case is of interest and merits record.

A married woman, aged 50, was suddenly attacked with acute epigastric pain and vomiting. Dr. P. S. Mandy, under whose care the patient had been 15 months ago for severe hæmatemesis, sent her to the Royal Victoria Hospital, Folkestone, for a "leaking gastric ulcer."

On admission to hospital all symptoms had subsided, and the patient was quite comfortable, and in a short time was on full diet. On the fifth day after her discharge there was a recurrence of the acute symptoms, but on readmission all symptoms had subsided. There was no tenderness in the epigastric area; but on one examination a sense of fullness was perceptible over the right rectus (Dr. Mandy had felt a definite tumour). A test-meal, examined by Dr. R. E. Bamford, the house surgeon, showed slight hyperacidity. The history suggested gall-bladder trouble, and an exploratory laparotomy was advised.

Before operation was performed, it was thought an X ray might throw some light on the condition, and this completely altered the diagnosis of gall-bladder. Colonel C. H. L. Palk, radiologist to the hospital, reported:—

"The lower border of stomach reached several inches below the umbilicus, peristalsis poor, body of stomach appeared as two large areas connected by a narrow channel; there was no obstruction, although some barium was held up in the upper part; a good deal had passed on into the lower area. The condition is suggestive of chronic ulcer."

Operation.—The pyloric end of the stomach was filled with a growth, the size of a Tangerine orange, which on slight manipulation was released from this part of the stomach, and could be moved in all directions. The growth was removed by a partial gastrectomy.

The sudden onset of pain and vomiting was, no doubt, due to obstruction of the pylorus by the tumour, and if an examination had been made during one of the attacks the tumour would have been detected by palpation. The growth was rounded in shape, and partially covered with mucous membrane, which at one spot was ulcerated. The free surface was dimpled, the size of a small thimble. On section the tumour consisted of two encapsuled growths, one on each side of the dimple.

The report of the Clinical Research Association was as follows:—

"The section shows a fibromyoma arising in the upper layers of the muscular coat. It is little removed from a fibro-sarcoma in appearance, and some pathologists might give it that name, but we think it is probably an innocent growth. The condition is uncommon."

Folkestone.

A CASE OF BILATERAL HERPES ZOSTER.

BY E. R. C. WALKER, B.A. CAMB., M.B., CH.B. EDIN.,
RESIDENT PHYSICIAN, THE ROYAL INFIRMARY, EDINBURGH.

IN the following case the patient could not recall any previous illnesses, and did not remember being in contact with any case of herpes zoster or of chicken-pox.

He was a general labourer, aged 29, of Irish nationality. For about two months before the onset of acute pain he had occasionally experienced a tingling sensation on the upper part of his chest on both sides. About a fortnight before the appearance of the rash he had a stabbing pain about two inches above the left nipple. Ten days later

Showing distribution of lesions on the back after the vesicles had broken down. The photograph was taken by Dr. W. D. Small.

a similar pain developed on the right side at a somewhat lower level. Two days later the rash appeared on both sides. The patient thought it appeared first on the left side, but was not certain. The distribution was as follows: Right side: from ninth, tenth, and eleventh dorsal vertebræ spreading round the chest to midway between the umbilicus and ensiform cartilage in front. Left side: from fourth, fifth, and sixth dorsal vertebræ spreading round underneath the shoulder, above the nipple to fourth and fifth costal cartilages in front, and also down posterior fold of axilla and back of arm.

Condition on Admission.—When, on Feb. 2nd, 1924, he was admitted to hospital, seven days after the appearance of the rash, the temperature was 98·2°F., respirations 24, pulse 120. There was a slight rise of temperature in the evening, but this subsided during the night, as did also the respirations and pulse. Wassermann reaction was negative. Urine normal. Bowels slightly constipated.

He made a complete and rapid recovery.

The unusually long history may perhaps be due to the patient's nationality. He was somewhat vague as to facts, and his native courtesy made him very willing to oblige in the matter of remembering early symptoms. He was, however, quite definite about the pain above the nipple a fortnight before the appearance of the rash.

I have to thank my chief, Prof. Jonathan Meakins, for leave to publish the case.

KENT COUNTY OPHTHALMIC HOSPITAL, MAIDSTONE.—The annual report of this institution stated that the accounts were satisfactory, but owing to the transition state of the hospital, due to building and rebuilding operations, it was difficult to make any comparison with past years. The total sum realised by the Extension Fund Appeal amounted to over £15,000. The board expressed its deep gratitude to Mr. Wheler Bennett for his handsome contribution of £10,000 to the hospital. The importance of the Weekly Subscribers' Fund was shown by the fact that four years ago this fund amounted to £192 and had now increased to £7925. There were at the moment 206 cases awaiting admission.

Medical Societies.

NORTH OF ENGLAND OBSTETRICAL AND GYNÆCOLOGICAL SOCIETY.

A MEETING of this Society was held in Liverpool on March 14th, with Dr. A. DONALD, the President, in the chair.

DISCUSSION ON PRIMARY PULMONARY THROMBOSIS.

The discussion on the paper read by Prof. E. Glynn,[1] postponed from the meeting held on Jan. 18th, was opened by Prof. BLAIR BELL. He said that to gynæcologists the question of primary pulmonary thrombosis was of special interest, as in all gynæcological clinics throughout the world this disaster had occurred with greater frequency than in the clinics of the general surgeons. Prof. Glynn would, however, be the first to disclaim any suggestion that the idea of primary pulmonary thrombosis was a new one. It had frequently been discussed during the last 50 years, during which time there had been a considerable division of opinion not only as to whether primary thrombosis in the pulmonary artery was commoner than embolus of the vessel, but also concerning the relation of thrombosis in the systemic veins to clots in the pulmonary vessels, and, moreover, whether clotting in the pulmonary artery was centripetal or the reverse. Nevertheless, Prof. Glynn's name would always be associated with the pathology of the subject because he had based his views on strict pathological investigation, a method not adopted by the earlier writers. Prof. Blair Bell thought that the main pathological contentions submitted by Prof. Glynn could hardly be controverted. Prof. Glynn stated that he had performed 35 consecutive autopsies on cases of pulmonary embolus and thrombosis; and in 30 (85 per cent.) of these he had found that the fatal lesion was primary pulmonary thrombosis. He adduced as evidence of primary thrombosis not only the presence of blood-clots, which might be found in all lobes of both lungs, but also proof that they were of ante-mortem formation, for age changes, such as deposition of blood-pigment, were demonstrated in nearly all, and commencing organisation was found in the clot in one-third of the specimens—conditions that could not possibly have developed in the few minutes generally supervening between the onset of the lethal seizure and death. The question of pulmonary embolus did not require special consideration, for the cause and mechanism were easily understood. Moreover, embolism was comparatively rare. The discussion of Prof. Glynn's paper really centred on the problem of the causes and prevention of primary pulmonary thrombosis, and it was probable that the greater frequency of this condition after gynæcological operations was attributable to two causes: (*a*) injury to large veins; (*b*) proximity of large vessels to septic foci. With regard to the first, injuries might be produced in several ways, the chief of which were the temporary application of compression forceps to big vessels like the ovarian, and the stripping free of large veins from the surrounding tissues, in which circumstances actual clotting or pre-clotting changes might more readily be produced in the blood contained within the lumen of the vein. The proximity of large vessels to septic foci was no less important. The proximity of large vessels to a septic area was conducive to changes in the blood-stream by the passage of toxins or organisms through the vessel walls. If the sepsis was severe actual thrombosis might occur in the pelvic veins, in which case a pulmonary embolus was a contingency to be remembered and avoided by suitable measures, such as rest. If the sepsis were mild, local thrombosis did not occur, but the toxins which reached the blood-stream were predisposing factors of pulmonary thrombosis.

[1] THE LANCET, Feb. 23rd, 1924, p. 390.

Prof. Blair Bell next directed attention to the numerous other predisposing or determining factors of primary pulmonary thrombosis. These were classified in the following groups:—

1. *Abnormalities in the Blood before Operation.*—There was evidence to show that bacterial toxæmias, toxæmias due to malignant disease, and anæmia from loss of blood might all, in one way or another, lead to conditions in the blood favouring clotting. In addition, actual loss of water from the tissues of the body by excessive pre-operative purging must be considered a definite predisposing cause.

2. *Abnormalities in the Blood after Operation.*—After operation the changes in the blood that predisposed to clotting were due to loss of fluid from the tissues and the effects of anæsthesia. The latter produced in the blood changes that favoured intravascular clotting. Many years ago Prof. Blair Bell had found that in vitro chloroform produced hæmolysis much more readily than ether, and he had no reason to doubt that the same might occur in vivo. Acidosis also, which often supervened on anæsthesia, was a state favouring clotting of blood. Then, again, as Prof. Glynn had said, deficient oxygenation, the result of inactivity during convalescence, was a factor of the greatest moment.

3. *Abnormalities in the Rate and Force of the Flow of Blood after Operation.*—During convalescence, with the patient bedridden, all mental and physical incitements to a rapid flow of blood, an increase in the blood pressure, and a high degree of oxygenation of the blood were reduced to a minimum. How important as determining factors in regard to intravascular clotting the resulting alterations might be would have been realised from Prof. Glynn's remarks about the statistics of Prof. Blair Bell's own cases. Nevertheless, an endeavour had been made to eliminate as far as possible *all* predisposing and determining causes, for in regard to intravascular clotting absolute safety could only be obtained by the abolition of all possible influences, and not only of one or two. The various procedures, many in general use to-day, which in one way or another assisted in the avoidance of the terrible catastrophe were, therefore, summarised.

Pre-operative Precautions.—In cases, especially of fibromyomata, in which the patient was very anæmic, blood transfusion should be practised immediately prior to operation. Pre-operative purging and starvation had almost disappeared from surgical practice, for it was quite unnecessary and robbed the patient of fluid from the tissues. In certain cases in which operations were planned in connexion with malignant disease blood transfusion might greatly improve the state of the patient's blood. In septic cases operation should be delayed, if there was no danger to life, until some immunity in the patient had been established.

Operative Methods.—In connexion with the operation itself, care should be taken as far as possible to avoid stripping bare the great veins on the wall of the pelvis. Clamps should not be placed on large vessels, such as ovarian, prior to ligation; they should be tied cleanly, and then divided. This was specially important in hysterectomy for fibromyomata. In dealing with torsion of the pedicle of an ovarian tumour, in which thrombosis had already occurred, the ovarian vessels should be ligated as high as possible, and not merely at the site of the twisted pedicle. Septic areas in which organisms were alive should be drained; it was a wise procedure to drain all pelvic abscesses not enclosed in the uterus, tubes, or ovaries, which could be removed. Loss of fluid was prevented by careful hæmostasis, and by avoidance of the undue exposure of the peritoneal surface.

Post-operative Care.—With regard to post-operative measures designed to lessen the risk of pulmonary thrombosis, a few only could be mentioned. Loss of fluid, which was to some extent unavoidable during an abdominal operation, was made good by rectal salines, to which glucose had been added to reduce the condition of acidosis that followed the administration of all anæsthetics, but more especially chloroform which was still used by some. Fluid and food by the mouth should be given soon after operation. Intestinal distension, which impaired the movements of the diaphragm, could be effectually treated by the use of infundibular extract followed by turpentine enemata. The blood pressure could be raised, if necessary, with infundibular extract. Finally, the use of systematic exercises accompanied by deep breathing were of the highest value in the prevention of pulmonary thrombosis. Since the adoption of these in January, 1916, only one patient in the gynæcological wards at the Royal Infirmary and one in private practice had been lost from pulmonary thrombosis. The first, a much blanched patient with organic heart disease, died ten days after hysterectomy for fibromyoma. The sister in charge decided, on her own initiative, that the patient was not strong enough to practise movements. The other patient died on the fifth day after operation, and there was some doubt whether she also was not considered by the sister in charge too ill to perform the exercises—in fact, it was almost certain that she did not do them. Naturally, in the presence of thrombosis in the pelvic and femoral veins exercises should not be practised lest emboli be detached, but the patient should indulge in deep breathing.

From what had been said it would be realised that modern surgical practice included many, if not most, of the preventive methods emphasised, and this may have accounted for the fact that death from pulmonary thrombosis was not so common as formerly when patients were purged, chloroformed, and subsequently starved. Nevertheless, the statistics of Prof. Glynn showed that the exercises first described in detail by Prof. Blair Bell in the third edition of his "Principles of Gynæcology" (1919), and employed since January, 1916, had reduced the gynæcological wards at the Royal Infirmary from the head of the list in regard to both the number and the percentages of deaths from pulmonary thrombosis to the bottom. Methods that had effected such an improvement over a period of eight years could not be lightly criticised.

Prof. H. BRIGGS (Liverpool) asked when physical exercises should begin and whether the primary pulmonary thrombosis was consequential on a local lung infection. These surprises had not yet been fully explained by the general pathologists.

Mr. K. W. MONSARRAT (Liverpool) said that he considered that pulmonary embolism and primary pulmonary thrombosis should be considered separately. He thought that pulmonary embolism was usually due to the detachment of clot in wounds not sterile. With regard to pulmonary thrombosis, he considered an explanation had not yet been given of the tendency to the formation of the clot in the pulmonary artery. He considered that it was probably related to a variety of conditions in the lung which tended to chronic stasis in the pulmonary circulation, as, for example, post-anæsthetic bronchitis. He considered that ammonium carbonate was of some value as a prophylactic.

Miss F. IVENS (Liverpool) mentioned that she had had five cases of sudden death in a series of 2500 cases of abdominal section. Sudden death occurred when all was apparently doing well. In one case of death on the eighth day the post-mortem revealed only a much enlarged thymus. In the second, a robust young lady of 25, with a gangrenous appendix, death occurred as she stepped out of bed on the fourteenth day. In the third, an elderly lady with prolapse, two small fibroids, and a chronic appendix, death occurred suddenly on the ninth evening after operation. In the fourth, an anæmic woman of 37, with uterine fibrosis and infected cervix, death occurred nine days after a panhysterectomy. In all these cases the temperature chart and pulse-rate were normal, but sepsis could not be excluded. Two were private cases and post-mortems were unobtainable. In the

fifth, a married woman of 30, a right ovarian tarry cyst had been removed. A subnormal temperature was noted on the seventh day, with normal pulse. On the ninth, in the early morning after an action of the bowels, intense pain in the back occurred, and the patient became livid with rapid thready pulse. A violet coloration appeared over the abdomen and thorax, and death took place in four hours, consciousness persisting almost to the end. Miss Ivens thought it possible that in this case thrombosis had spread up from the ovarian veins, induced perhaps by toxins absorbed from the ruptured tarry cyst. The bacteriological findings were negative, but no post-mortem could be made. Miss Ivens stated that in none of her cases had exercises or massage been advised. Prophylactically she attached more importance to an aseptic technique, to the avoidance of bruising of the tissues, and to the dilution and diminution of toxins, whether bacterial or the products of tissue death which tended to cause vascular degeneration.

MR. FRANK JEANS (Liverpool), speaking from the point of view of the general surgeon, said that two factors were important in the production of the condition: (*a*) Slight (not severe) sepsis. He had known pulmonary thrombosis to occur after a breast operation in which a serous effusion had been aspirated on the eighth day and proved sterile on culture—a severe test of asepsis—but one which did not preclude a minute infection. (*b*) Lack of movement on the part of the patient. His impression was that the condition always occurred in the case of the placid patient who was as good as gold and always did as she was told. The patients who got excited and waved their arms and got out of bed never got thrombosis. For this reason he favoured exercise and agreed with Prof. Blair Bell.

Some Theories Criticised.

MR. P. R. WRIGLEY (Manchester) said that his personal experience of this condition was not extensive. In common with other surgeons who had been operating for a number of years he had had a few unexpected and sudden deaths following operation which had been attributed to pulmonary embolism, but for various reasons post-mortem examination had not been possible. Thirteen years ago he operated on a middle-aged woman for extensive varicose veins in the leg, a case which nowadays he would refuse to treat by operation. A few hours after the operation she sat up in bed and became very dyspnœic and died within a few minutes. This he regarded at the time, and still believed to be, a pulmonary embolism. He had met with several other cases in which on about the tenth day following laparotomy the patient had suddenly complained of pain in the chest with great difficulty in breathing followed by hæmoptysis. The symptoms had persisted for a few days, gradually lessening and finally disappearing. These symptoms he believed to be due to thrombosis in the systemic circulation resulting in the minute emboli in the lungs. His house surgeon at the Manchester Royal Infirmary had taken considerable pains to investigate post-mortem records of the Infirmary for the past five years with the following result: During that period there were nine patients who died after operation, and in each case death was attributed to pulmonary embolism. Full details of the clinical features of these cases were not available, but in all of them the operation wound was stated to be nearly healed, so that some days at least must have elapsed between the day of operation and death. In six of these cases the post-mortem revealed thrombosis either of the main pulmonary artery or of one or both of its branches. In the other three cases post-mortem examination showed acute dilatation of the heart and in no case was there an embolism, which bore out Prof. Glynn's statement that primary thrombosis of the pulmonary artery was much more common than embolism. It had been suggested that pulmonary embolism and thrombosis were due to two chief factors—mild sepsis and pulmonary stasis. If mild sepsis was an important factor, why was it more common to get thrombosis or embolism after operations on the pelvis and abdomen and so rarely after operations on the head, neck, and arms, unless this sepsis was due to some organism which normally inhabited only the abdomen, such as the *Bacillus coli*? If due to pulmonary stasis, why did it not more frequently follow operation such as radical amputation of the breast, where one side of the chest must have its movements impaired? On the other hand, after abdominal operations one would expect thoracic breathing to be much exaggerated. He thought there must be many other factors at work as well as these two. He had never ordered routine exercises for patients, but had encouraged them to move and to change their position from the day of the operation with the idea of preventing bronchitis and pneumonia. Prof. Blair Bell had suggested that one predisposing cause might be stripping of large veins in the pelvis, but if this was the case, why did we not more frequently meet with it after operations for removal of malignant glands from the neck and the axilla where the large venous trunks were dissected free from their sheath for a distance of some inches?

Secondary Anæmia as a Factor.

DR. FLETCHER SHAW said he spoke merely to mention one factor in the production of thrombosis which previous speakers had overlooked—viz., anæmia from long-continued hæmorrhage. In his own private practice he had had three cases of sudden death attributed to embolism or thrombosis, all following hysterectomy for fibroids. Two of these occurred within a few weeks of each other and the shock had caused him to investigate the matter deeply. He found in two years he had performed hysterectomy for fibroids on 135 patients and five of these were noted as suffering so severely from the effect of hæmorrhage that they were kept under treatment for some time before operation was undertaken. Of these five anæmic patients, three died, two from embolism or thrombosis and one from heart failure, while amongst the other 130 patients there was only one death and that from acute nephritis, which probably had nothing to do with the operation. He thought this profound anæmia before operation should be emphasised as a contributory factor in the production of thrombosis.

THE PRESIDENT remarked that he was in full agreement with Dr. Fletcher Shaw in attributing great importance to profound anæmia as a contributory cause of thrombosis, and was surprised that so little notice had been taken of this in the remarks of previous speakers. After a careful study of the records of 830 abdominal operations in his nursing home, he had found that three patients had died as the result of thrombosis or embolus. In each of these cases the operation was for a large fibroid tumour, and all the patients were profoundly anæmic. He thought that in every case of thrombosis there was some infection or toxæmia, and yet the curious fact remained that thrombosis seemed rarely to occur in cases of acute pelvic abscess. He had never seen it following operation for pyosalpinx or abscess of the ovary. The organism must be of a type which favoured clotting of the blood. He thought that in most of these very anæmic patients with fibroid tumours there was a certain amount of toxæmia. The most important point in the prevention of these cases was the most scrupulous, and even exaggerated, attention to aseptic technique, in all tumours associated with much hæmorrhage. He felt sure that the cases were not nearly so common in recent years as they had been. Blood stasis might have some effect, but it only played quite a secondary part.

Sepsis as a Factor.

DR. MORRIS J. COHEN believed that sepsis was the main factor in the causation of pulmonary thrombosis. In 22 cases investigated at the Thompson Yates Laboratories, 11 showed definite sepsis at site of operation; in 11 cases where weight of spleen was noted the average was 7 oz. (cf. normal 4 to 5 oz.).

In 18 cases bacteria were demonstrated in systemic or pulmonary clots or in the lungs. In some they were found in all three places. In 11 of these cases streptococci were prominent. Pre-existing lung lesions such as emphysema, recent or old pleurisy, quiescent tubercle were demonstrated in 16 cases. The temperature charts in all cases showed abnormalities, although in several the temperature was but slightly raised. The reason why thrombosis is commoner in the pulmonary than in the other arteries appears to be the fact that although the pulmonary artery is such by name and structure, yet it functions as a vein. The blood it conveys is of a more venous character than in any vein in the body: it is rich in carbon dioxide and in septic products and products of disintegrating tumours if sepsis or neoplasm be present, and it is also rich in kinase if thrombo-kinase be liberated in the tissues. All these are potent factors in the formation of a thrombus.

GLASGOW SOUTHERN MEDICAL SOCIETY.

A MEETING of this Society was held on March 13th, with Dr. D. G. CARMICHAEL in the chair, when Mr. W. A. SEWELL read a paper on

Intussusception.

He outlined the pathological features of the condition and its age and sex incidence. With regard to the mechanism of production of intussusception, he did not agree that there was usually some antecedent disturbance of the bowels; in his series of 31 cases, diarrhœa was present in only one. This was in agreement with the observation by Perrin and Lindsay that no case of intussusception was admitted to the London Hospital during an epidemic of diarrhœa which occurred in London in September, 1911; further, he had been informed by Dr. Leonard Findlay that intussusception had never developed in any of the many hundred cases of gastro-enteritis treated by the latter in the Royal Hospital for Sick Children, Glasgow. Occasionally cases of gastro-enteritis developed ileo-colitis, with blood and mucus in the stool; but in such vomiting was a rare symptom.

There were several theories regarding the cause of the invagination. (1) Presence of a polypus or neoplasm. This was very rare in the infant, although occasionally a swollen Peyer's patch might function as a sessile polyp and form the apex of an invagination. (2) While a long and loose mesentery might facilitate the formation of an intussusception, it was not the cause; further, such a condition of the mesentery was frequently found in adults, in whom intussusception was extremely rare. (3) Perrin and Lindsay had advanced as the determining factor the mass of lymphoid tissue situated around the terminal inch of the ileum. This lymphatic aggregation was most developed in the young child, and became progressively less with age. When it became inflamed and swollen it was treated by the gut as a foreign body, and might become the starting point of an intussusception. The greater liability of boys to infantile ailments, and the fact that the amount of lymphoid tissue in the body varied directly with the size of the child, might explain the preponderance of males in cases of intussusception.

The congestion and swelling of this lymphoid tissue was generally ascribed to changes in feeding during the early months of life. Mr. Sewell, however, felt that more importance should be attached to the appendix as a contributory factor in causing inflammatory changes in the lymphatic tissue of the ileum. In spite of the fact that acute appendicitis was very rare in the infant, he had been struck by the frequency with which lesions of a chronic type were noted in this organ during operations for intussusception. The appendix might be kinked, adherent, or ecchymosed; and while it might sometimes be difficult to exclude operative trauma in certain types of cases, he felt that his view was supported by the number of cases of vague abdominal troubles in children which were completely relieved by the removal of an appendix which showed no notable macroscopic or microscopic deviation from the normal.

With regard to diagnosis, Mr. Sewell thought that when a history of screaming, vomiting, and blood and mucus from the rectum was elicited, no time should be lost in sending the child to hospital for observation. An anæsthetic should be given, and the abdomen carefully palpated for the typical tumour, and rectal examination should never be omitted.

Treatment resolved itself into laparotomy and reduction at the earliest possible moment. A point of importance was the marked shock which frequently followed the reduction of the invagination; he had found that the application to the bowel of large swabs soaked in saline solution at a temperature of 105° F. did much to minimise this. Where the condition of the child warranted a slightly longer operation, he always performed appendicectomy, and he always closed the abdominal wound in layers.

In his series of 31 cases he had lost six; this figure included a case which recovered from the primary operation, but died after a secondary operation for ventral hernia. Resection had been necessary in four cases; in one the patient, an infant of three months, had been ill for 72 hours, and the gut was gangrenous; this case died. The remaining three cases—in children of 10 years, 2 months, and 3 months—recovered.

Prof. JOHN GRAHAM mentioned a case in which the invagination was due to a piece of paper swallowed by the child, and Mr. ROBERT TENNENT described a case of Henoch's purpura, where a hæmorrhage in the bowel wall had been the starting point of an intussusception.

BRIGHTON AND SUSSEX MEDICO-CHIRURGICAL SOCIETY.

A MEETING of this Society was held on April 3rd, Dr. ELIOT CURWEN, the President, being in the chair.

Dr. DONALD HALL read a paper on

Electrocardiographic Records.

Lantern slides were shown of normal and abnormal electrocardiograms, the latter including various forms of premature beats, sino-auricular block, right and left-sided preponderances, auricular flutter, and auricular fibrillation. Diagrams were also shown upon the screen of the apparatus and of the anatomical relationships of the conducting apparatus within the heart. He said that this method of investigation was particularly useful in analysing accurately the different types of irregularity of rhythm, and in determining whether or not abnormalities of rate were caused in a rapid heart by an ectopic focus of stimulation, or in a slow heart by some degree of heart-block. The ventricular complexes gave information as to the state of the myocardium, which was not to be obtained by ordinary clinical methods. Electrocardiographic records gave information as to diagnosis, prognosis, and treatment, and from the last standpoint especially as to which cases were or were not likely to be improved by the use of digitalis. Too often in arrhythmia, or in tachycardia, digitalis was employed when its exhibition was useless, if not indeed actually harmful. With the precise knowledge afforded by an electrocardiographic record of the case this error could be avoided.

The PRESIDENT, Dr. H. GERVIS, Dr. L. A. PARRY, Dr. E. F. MAYNARD, and Dr. H. F. SEYMOUR discussed the paper.

Dr. H. M. GALT showed microscopical slides of Normal Heart Muscle; Fatty Degeneration of Heart Muscle; Fatty Infiltration of Heart Muscle; and a Section of Heart showing Fibroid Change.

Reviews and Notices of Books.

CANNED FOODS IN RELATION TO HEALTH.

By WILLIAM G. SAVAGE, B.Sc., M.D. Lond., County Medical Officer of Health, Somerset. Cambridge University Press. 1923. Pp. 146. 8s. 6d.

THIS book, which consists of the Milroy lectures for 1923, slightly amplified, comes as an interesting sequel to the work on food poisoning and food infections by the same author published in 1920. Dr. Savage shows how immensely this industry has grown during the war, so that canned foods have ceased to be a subsidiary means of supply and must now be regarded as an essential source of food. Though the canning industry is small in this country it is important in the United States and the overseas Dominions. Thus the U.S.A. census of 1914 showed 4220 canning establishments in that country, with 88,069 persons engaged. The interesting suggestion is put forward that a great increase of the canned fish industry would be possible in this country by means of a floating cannery to follow the abundance of fish as it moves past the various centres on the British coast. Dr. Savage has examined various methods of manufacture, and pays a high tribute to the work done by the National Canners Association (U.S.A.) in the improvement of the food products of its members. He also shows that the control exercised over canned foods at the port of entry is not satisfactory, and that better and more uniform methods are needed for dealing with the contents of rejected tins. These are now often wasted, but means might be devised for their legitimate use for various purposes. Dr. Savage urges that the date of preparation should be stamped on all canned foods, and, further, that there should be some code mark, disclosed to the Ministry of Health, whereby the tin could be traced back to the actual canning factory. As regards one variety of canned food—namely, condensed machine-skimmed milk—Dr. Savage sees no need for it, and thinks its manufacture in or importation into this country should be prohibited.

The possibility of the causation of disease by canned foods has been much discussed. Dr. Savage's conclusions are that canned foods are safer than fresh foods, but should not be made the main articles of diet, and deficiency in vitamins should be made good from other sources. He shows, further, that there is no evidence in favour of the widespread belief in the great toxicity of decomposing food, and that the danger to health is the risk of the infection of food with the specific bacteria associated with food poisoning. Defects in the preparation and distribution of canned foods are pointed out in his book, and the necessity for persevering efforts to remove them is urged. The author is, however impressed by the great value to the community of this method of food preservation, and convinced that its special risks are for the most part readily guarded against.

GALVANOMAGNETIC AND THERMOMAGNETIC EFFECTS.

The Hall and Allied Phenomena. By L. L. CAMPBELL, Ph.D., Professor of Physics, Simmons College, Boston, U.S.A. London: Longmans, Green and Co. Pp. 311. 16s.

Hall, an American physicist, discovered that a magnetic field applied at right angles to the direction of an electric current in a conductor has some effect on the equipotential lines—it is quite a small effect and could easily be missed; there are temperature effects associated with this particular experimental arrangement, and these are also minute. This book of over 300 pages is concerned with these two and other associated effects. It must represent a painstaking piece of work, because the literature has had to be gathered from many obscure sources; perhaps this is a case in which the appearance of a book on the subject marks its end rather than its beginning. Doubtless the interpretation of the Hall effect in 1879 was very obscure, though Kelvin had predicted it. When the action was tested in different metals, theories on the subject multiplied, and the author gives quite a number of them in some detail. With the discovery of the electron, some of these theories appeared unnecessarily involved, and at nearly the end of the volume we learn that Hall now interprets the phenomena in terms of the movement of electrons having different functions within the atom.

The book is well produced and has an excellent bibliography.

TROPICAL DISEASES.

Handbuch der Tropenkrankheiten. Third edition. Vol. I. General Editor: Prof. Dr. CARL MENSE. Cassel, Leipzig: Johann Ambrosius Barth. 1924. Pp. 713. Gold marks 56.

THOSE who are familiar with the first edition of Mense which appeared in 1905 will hardly be surprised at the rather pretentious size and remarkable wealth of detail displayed in this—the third—edition. The bulk of the work is much increased by the inclusion of the large bibliography upon which German workers lay so much stress; the addendum dealing with the mosquitoes, for instance, occupies no less than 63 pages, and obviously is by no means complete.

This volume includes only two subjects—Applied Medical Entomology by Adolf Eysell, and Hæmatology by Victor Schilling. The first-named section contains all that is known on the classification, biology, anatomy, and morphology of ticks, insects, fleas, lice, spiders, and linguatulids. The illustrations, partly in line and partly photographic, are excellent. The second portion is an elaboration of a similar work by Schilling in the second edition, which was afterwards published separately in 1914. We have nothing but praise for this exhaustive account of tropical blood work, which is hæmatology in the best sense of the word; four beautiful coloured plates accompany it.

ORTHOPÆDIC SURGERY.

Selected Essays on Orthopædic Surgery from the Writings of NEWTON MELMAN SHAFFER, M.D., F.A.C.S., Emeritus Professor of Orthopædic Surgery, Cornell University, &c. With Foreword by Dr. LOVETT and Dr. FISHER, and Comments by Dr. COTTON, Dr. NUTT, Mr. BLAGDEN, and Mr. HARDON. London and New York: G. P. Putnam's Sons. 1923. With frontispiece, and 14 plates and 51 figures. 85.

ALTHOUGH the papers reprinted in this handsome volume are not new—most of them were written more than 20 years ago—they are of great interest for they contain the fruits of an experience of the surgery of deformity and joint disease which has been unusually extensive. Dr. Shaffer may be considered as the best known living exponent of conservative orthopædics, and one who boldly preached his doctrine at a time when general surgeons were over-inclined to perform extensive operations for tuberculous disease of the joints. In his foreword, Dr. R. Lovett, of Boston, emphasises the importance of Shaffer's work and teaching on tuberculosis of the joints, and of his original contributions to our knowledge of various static deformities of the feet and their correct treatment. His skill in devising and in applying corrective and retentive instruments is of the highest order, and was never better shown than in his treatment of contractions of the foot and shortening of the tendo Achillis. He was one of the first to recognise the importance of the latter condition in the production of certain forms of flat-feet, and the reprint of his original papers on the subject of Non-Deforming Club-foot and on Flat-foot will well repay study at the present time, especially as the author has added to them up-to-date notes which enhance their interest.

The papers on Pott's Disease and Pott's Paralysis embody sound theories and modes of treatment which

have hardly been improved upon, except as regards heliotherapy, in the 34 years which have passed since the later of them was written. As much may be said for the essay on Non-interference in Abscess of Chronic Tuberculous Disease of the Joints, of which the conclusions have been amply justified by subsequent experience—they practically form the basis of the most modern treatment in this country and on the continent. The reader must, however, be struck by the fact that not one of the three dozen papers which form this volume is devoted to a study of anterior poliomyelitis or its resultant deformities. This omission cannot have been due to lack of opportunities of study and treatment of this disease. Apparently the subject did not appeal to Dr. Shaffer. Yet he was a pioneer in the movement for the State care of cripples, and for some years superintendent and surgeon in chief of the New York State Hospital for Cripples, where assuredly there were many cases of infantile paralysis among the inmates.

We are, perhaps, justified in assuming that since the title-page of this book informs us that Dr. Shaffer was a medical student as long ago as 1863, he has now retired from active practice, and that in congratulating him on this, his farewell publication, we may wish him many years of enjoyment of his well-earned leisure.

PHYSIOLOGY AND PATHOLOGY OF BONE.

Die Normale und Pathologische Physiologie des Knochens (Experimentelle Orthopädie). By Dr. WALTHER MÜLLER, Privatdozent für Chirurgie und Orthopädie, Assistent der Chirurg. Univ. Klinik, Marburg (Lahn). Leipzig: Johann Ambrosius Barth. 1924. Pp. 218. Gz.12–14.

A HIGHLY specialised book of this description will, of course, only appeal to a certain audience, but to those interested in experimental orthopædics it can be well recommended. Stress is naturally laid on the importance of mechanical factors in connexion with the growth and modification of bones, and these are such as render it often highly unsafe to draw conclusions from animals for application to man. There are 67 figures, mostly radiographs, illustrating abnormalities of bones, variously produced. Bone regeneration and callus formation, rickets, and osteomalacia are fully discussed, and much prominence is given to the influence of the organs of internal secretion on the physiology and pathology of the bones. Altogether it is a very valuable monograph.

ANÆSTHESIA IN DENTAL SURGERY.

By T. D. LUKE, M.D. Fifth edition. Edited by J. STUART ROSS, M.B. With Chapter on Local and Regional Anæsthesia by Major W. T. FINLAYSON, L.D.S. Ed. London: William Heinemann. With illustrations. Pp. 238. 10*s.* 6*d.*

OWING to Dr. Luke's death the present edition of this book is Dr. Ross's work, and it more than maintains the standard set by the original work 20 years ago. In a comparatively small volume which is intended primarily to be of practical help to those not constantly engaged in anæsthetics there cannot be much space devoted to the physiology or chemistry of anæsthesia. Nevertheless, Dr. Ross has managed to include the leading facts and to write the book in such a way that its reader is led to understand the principles on which he should work, and to become no mere rule-of-thumb administrator. The chapter on local and regional anæsthesia, contributed by Major Finlayson, gives clear and illustrated directions for carrying out the various injections. The whole book is an admirable guide for those entering upon the administration of anæsthetics in dental cases.

PLANT PHYSIOLOGY.

The Physiology of Photosynthesis. By Sir J. C. BOSE. London: Longmans Green and Co. 1924. With 60 figures. Pp. 287. 16*s.*

As is customary with this author, this book is not a treatise on the whole problem of photosynthesis, but an account of the investigations made by himself and his associates at the Bose Research Institution in Calcutta. And, as one would expect from his previous work, it is largely devoted to the description and exploitation of self-recording apparatus for measuring plant activities. He has worked with the submerged water-plant *Hydrilla* and recorded the evolution of oxygen. With this as a standard test-object he has investigated the influence of light, temperature, and concentration of CO_2 and of the state of functional activity which he calls "tone." Those with no particular interest in botany will find his apparatus worth considering; they may quite likely extract something from it which would be useful in other work. And the questions of how the various factors which influence photosynthesis influence one another, of limiting factors, and whether the total change is the sum or the product of its constituents are of wide general interest.

THE KINGDOM OF EVILS.

Psychiatric Social Work presented in 100 Case Histories, together with a Classification of Social Divisions of Evil. By E. E. SOUTHARD, M.D., late Bullard Professor of Neuropathology, Harvard Medical School; and MARY C. JARRETT, Associate Director, Smith College Training School for Social Work. With an Introduction by RICHARD C. CABOT, M.D., Professor of Social Ethics, Harvard University. London: George Allen and Unwin, Ltd. 1923. Pp. 708. 24*s.*

THIS book was almost completed before the sudden death of Dr. Southard in 1920. It is a record of a large amount of unselfish work, but the rather indefinite value ascribed to it in the preface and introduction is confirmed by perusal of the case-histories. The psychiatric jargon in the descriptions is unfortunate, and only obscures the issues. Nothing is gained by classifying indiscriminately as *Errores* ignorance, misinformation, and misinterpretation, and as *Vitia* not only vice, but also such bad habits as "laziness about brushing one's teeth." The actual records are for the most part hazy and indefinite, though some of the cases are interesting, and there are useful hints in the book. For example, Case 6, an alcoholic of 20 years' standing, seems to have been much benefited at the Psychopathic Hospital by the meetings of the "men's club" organised by convalescents from alcoholism and one or two social workers. Further details of this mutual work by a group with the same failing would have been interesting.

Throughout the grain is so mixed up with the chaff that few are likely to have the time or patience to attempt its separation, but those who do so will find it worth while.

PATHOLOGY.

Lehrbuch der Speziellen Pathologischen Anatomie für Studierende und Aerzte. Seventh and eighth editions. Von EDWARD KAUFMANN, ord. Prof. der Allgemeinen Pathologie u. Path. Anatomie. Göttingen, Berlin, and Leipzig: Gruyter and Co. In two vols. Pp. 1962.

Prof. Kaufmann's well-known text-book on special pathology has been entirely revised and considerably increased in size, and now forms two massive volumes. It is a monument of industry and learning, and is the acknowledged work of reference in this subject. Omissions have been searched for but in vain, and though it is scarcely likely that the author has touched absolute perfection, any lesion not mentioned in his book may safely be looked upon as extraordinarily rare if not actually unique. In spite of its size, the book has been written with due regard for relative values; many subjects have been skilfully condensed, and though a more detailed treatment of certain aspects of disease might be desired, it must be acknowledged that the author's judgment on what should be stressed and what treated more

lightly is generally sound. The format is excellent, and we presume that the numbering of the editions means that a later version has replaced an earlier.

COLITIS.

Les Colites. Consultations sur les maladies de l'estomac et de l'intestin (cours de gastro-entérologie de l'Hôpital Beaujon). Par PAUL CARNOT, PAUL HARVIEX, R. FRIEDEL et LARDENNOIS. Paris: J. B. Baillière et Fils. 1923. Pp. 224. Fr.10.

THIS little book contains a series of lectures on the modern methods of gastro-enterologic diagnosis and treatment. A mass of information on the normal functions of the alimentary canal is compressed into small space, and is still in a form easily assimilable by the student. Radioscopic examination, both by screening and by test meals, the chemical and microscopic examination of the fæces, sigmoidoscopic examination, the normal anatomical structure of the intestinal canal are all reviewed in turn. The illustrations are rather crude diagrams, but serve their purpose.

The Conduct of Medical Practice.

A Series of Articles by Experts dealing with the Difficulties Encountered in Professional Life and How to Meet Them.

XV. MEDICAL CERTIFICATES IN LUNACY.

BY BEDFORD PIERCE, M.D., F.R.C.P. LOND.,
CONSULTING PHYSICIAN TO THE RETREAT, YORK.

"Litera scripta manet."

IT was clearly the intention of Parliament that medical men discharging the responsible duties assigned to them under the Lunacy Acts should be adequately protected. Section 330, Subsection (1) states:—

"... a person ... who signs or does any act with a view to sign any report or certificate purporting to be a report or certificate under this Act, or does anything in pursuance of this Act shall not be liable to any civil or criminal proceedings, whether on the ground of want of jurisdiction or on any other ground, if such person has acted in good faith and with reasonable care."

Nothing could be more explicit, but it would appear from a recent judgment that the onus of proving good faith and reasonable care may be thrown upon the physician. Moreover, though it is stated in Subsection (2) of the same Section 330, that a judge may, if so inclined, stay any proceedings against a physician, it does not say that he *must* do so, if he is satisfied that the physician did exercise reasonable care and acted in good faith. The whole position is therefore unsatisfactory, and medical men who do their duty both to their patients and to the community in the most conscientious manner may be placed in an awkward and even serious position.

Position in Need of Amendment.

The present state of affairs is so extraordinary that it is surprising any enlightened community can tolerate it. The public provides and equips at very great expense mental hospitals for the treatment of mental disease but declines to allow anyone to be received voluntarily for treatment. Certificates in lunacy are required before a patient can be admitted, and upon medical men is placed the responsibility of signing these certificates. Yet it would seem they are not effectively safeguarded in the discharge of this public duty. Years afterwards the findings of medical men in a matter that is peculiarly their province may be reviewed and even reversed by a jury of laymen none of whom had even seen the patient at the time.

All are agreed that the law requires amendment; but it may be long before anything is actually done, and in the meantime patients have to be treated and certificates must be signed. The medical profession will not stand aside and permit these patients to suffer and to cause grievous suffering to others merely because it may involve some personal risk to help them under existing legal conditions. In my opinion, however, this risk is for the general practitioner almost negligible if reasonable precautions are taken. Doubtful cases are not so numerous as is assumed, and where there is doubt delay rarely does harm. As a rule, the difficulty is not in the signing of the certificate, but in deciding whether hospital treatment is desirable.

General Principles of Certification.

The chief consideration in the great majority of cases is the welfare of the patient, it being impossible to secure proper treatment at home. Until patients can be received voluntarily into mental hospitals, large numbers of poor persons must be certified, since in no other way can they be treated effectively. The establishment of psychiatric clinics in large centres of population would to an even greater extent reduce the need for certification. In a minority of cases legal detention is demanded in the interests of the public; and here special care is needed, and it is often desirable to see a patient several times before coming to a decision.

For private patients two certificates by independent medical practitioners are required. They must see the patient separately, and one of them should, if possible, be the usual medical attendant of the patient. This provision alone greatly reduces the risk of legal trouble later on. A single certificate, however, suffices for a pauper patient; and here it must be remembered that the inability to meet the cost of treatment frequently results in the patient being classified as a pauper, although but for this the family is self-supporting. One certificate, also when accompanied by a medical certificate of emergency, suffices for the admission of a private patient as a temporary measure under an urgency order.

The Certificate a Legal Document.

The certificate is a legal document, and as such it must be judged by legal and not by medical standards. It gives the evidence which justifies the serious step of depriving a person of his liberty. It consists of two parts, usually printed on the forms provided, and I fear sometimes the full meaning is not fully appreciated. First, it states that the patient is of unsound mind, second, that he is "a proper person to be taken charge of and detained under care and treatment." Then follows the reasons for arriving at this conclusion. It is not sufficient to show that the person is insane; it is also necessary to show that he needs to be taken care of and detained.

Facts Observed at the Time of the Examination.

These facts constitute the essential part of certification, and unless they are adequate the certificate is invalid. But in some cases, although there is no doubt about the insanity of the patient and the need for detention, he may during the examination give plausible accounts of his conduct or may deny the statements made by trustworthy people. Again, a patient may vary in his mental state, being reasonable when the doctor is present and quite otherwise when he has gone. A second and third examination will in such cases usually suffice to elicit the actual facts.

The most difficult cases are those with mild degrees of mania or melancholia. The former may ruin themselves with extravagance or exhibit serious misconduct, whilst the latter sometimes commit suicide before steps are taken to safeguard them. Whatever is done or is left undone will probably be criticised adversely after the event by somebody. On the whole, however, the risks of delay are less serious than those involved in prompt certification. Moreover, in this type of case it will be found almost impossible to describe the condition in terms that will be convincing to anyone who cannot observe the patient for himself.

It is often possible to bring information received from friends up to date by discussing it with the patient. Thus: "He admitted that he stopped a complete stranger in the street yesterday and asked him why he made an offensive remark and that the stranger denied having spoken at all." Again, the patient's manner and mode of reply when reminded of incidents are valuable evidence: "He smiled and appeared unconcerned when I asked him why he struck his mother last Monday." Sometimes the refusal to answer questions is in itself important: "When asked why he refused his food and whether it was true that he thought it poisoned, he made no reply." In many cases it is desirable to tell the patient plainly that the state of his mind is called in question; this not only gives him full opportunity of objecting, but the physician is the better able to form an opinion on the mental state.

The examination of a patient should never be hurried; notes should be made at the time or immediately afterwards. It is important to be certain that the condition observed cannot possibly be due to the effect of sedatives, alcoholic intoxication, febrile delirium, or any purely temporary condition affecting the integrity of the mind. More than 30 years ago, in Scotland, I examined a newly-admitted querulous depressed patient; I had doubts about the insanity but none about a recent pneumothorax which had been overlooked.

Facts Communicated by Others.

These may be entirely omitted; and in many cases the certificate is better without them. Their insertion is necessary when the true meaning of the facts observed by the physician is not clear otherwise.

There are many important facts of which the physician may have no personal knowledge, such as the refusal of food, the existence of faulty habits, acts of violence, and much besides. The presence of delusions often cannot be asserted with confidence without information from others. The patient may declare he is utterly ruined, and if this is given as evidence of insanity it must be accompanied by a statement by a trustworthy informant to the effect that the patient's belief is not justified. The doctor himself is not likely to know the true financial position. The greatest care should also be taken with regard to delusions of infidelity, it being often impossible to ascertain the truth with certainty, and the possibility must be borne in mind that these and delusions of suspicion may have some basis of fact.

A certificate is often strengthened if it can be shown that the patient's manner or conduct has undergone a marked change. The facts observed may perhaps be excused or explained away had they been found in certain other individuals, but when they are opposed to the whole tenor of the patient's former life they are significant. Relatives can give evidence on this point. Nevertheless, a certificate must not rest on information supplied by others, however trustworthy it may be, although such information may be used to great advantage in its support.

The Wording of the Certificate.

It is by no means easy to find appropriate words. The certificate should be terse and to the point, and a long certificate is often a weak one. Nevertheless, economy in words must not leave their meaning in doubt. Many words are almost without value unless amplified or illustrated. Such words, for example, as excited, noisy, depressed, abusive, moody, taciturn, unreasonable, and suspicious may be used to describe conduct which is perfectly normal in certain circumstances. A certificate containing the statement, "He was very noisy and abusive, and called me a damned fool," was returned by the Commissioners with the stereotyped reply, "Will the certifier state some facts more clearly indicating insanity?" (!)

In the endeavour to avoid ambiguity it is undesirable to use technical terms. When they are necessary they must be explained or illustrated. For instance, if the word hallucination or delusion is used, an explicit description of the symptoms should follow. It is not enough to say that the patient suffers from hallucinations of hearing. Particulars should be given, such as, "He told me that he heard the voice of his deceased sister speaking to him last night." In some cases it is almost impossible to word a certificate so as to avoid all conceivable misunderstanding. This difficulty, however, is no excuse for the use of loose or vague expressions which give the impression of haste.

It is a good plan to write a certificate first in draft, and before copying to go through it with the thought that it may one day be produced in court, and perhaps criticised unkindly by an advocate who wishes to distort its meaning.

Other Important Points.

Attendant Circumstances.—Obviously the physician cannot put all the facts on the certificate, and in a difficult case there is no objection to his attaching to it a memorandum giving additional particulars. It should be remembered, however, that all these details have to be copied in the mental hospital and cause much extra work. In most cases it suffices to make precise notes of the attendant circumstances and pigeon-hole them carefully. Such notes are invaluable if difficulty subsequently arises. In court it seems to be assumed that a doctor can remember all particulars of a patient examined years ago, and if no records are forthcoming it is quite possible that an adequate certificate may be made to appear weak and incomplete. The admission by the physician under examination that he has forgotten some important fact may create a bad impression.

Dates.—There are three distinct situations to consider: (1) When a patient is received on an urgency order, the medical practitioner signing the certificate must personally examine the patient not more than two clear days[1] before the reception of the patient in the hospital. (2) In the case of a private patient the two medical practitioners must separately examine the patient not more than seven clear days before the date on which the petition is presented to the justice of the peace. (3) In other cases the medical examination must be made not more than seven clear days before the date of the justice's order.

It is obviously unwise to run any risks of the certificate being out of date, which will result in the patient being discharged, and consequently the examination should take place well within the prescribed period.

Minor Details.—Lack of reasonable care may easily be imputed if the certificate is incorrect or incomplete in its minor details. It is astonishing how many certificates fail to describe informants accurately or fail to give their proper addresses. Not a few contain some mistake in dates, or omit to give the full names of the patient. Marginal notes on the certification form give full particulars of what is required, and in quite 10 per cent. of the cases it would appear that they have not been carefully read. Medical men, who are chiefly concerned with the welfare of the patient, are apt to be impatient of legal formalities. But they should remember that, when the liberty of the subject is involved, accuracy in every item is imperative and none of the details required is unimportant. In any case it is unwise to ignore provisions laid down by Act of Parliament.

So far as I am aware the University of Durham is the only examining body that requires every student in his final examination in medicine actually to examine a mental case and sign a certificate in lunacy.

In conclusion, I do not think that the practitioner need have any fear of legal proceedings if he remembers that the certificate is a legal document, if he takes pains in the examination of the patient and in the drafting of the certificate, and if he makes notes at the time of the main circumstances which influenced his judgment, and, of course, preserves the notes.

[1] The term "two clear days" is construed so as to allow two entire days to elapse between the examination and the reception of the patient. For instance, in a case of urgency the patient may be examined on a Tuesday and be received in the mental hospital on a Friday.

THE LANCET.

LONDON: SATURDAY, APRIL 12, 1924.

AMBULANCE CASES IN LONDON.

LAST June the PRINCE OF WALES, as President of King Edward's Hospital Fund for London, appointed a Special Committee to inquire and report "on the methods employed for ascertaining where bed accommodation is available at hospitals in the metropolitan and neighbouring areas for accident cases requiring admission, and on the proposal that daily reports of vacant beds should be supplied to the police and ambulance authorities, and to make such consequential recommendations as they may consider desirable." This Committee having heard representative witnesses and interpreted its duties in a liberal manner, has now issued a report of great practical interest. The Committee has been unable to discover any method by which, with the means at their disposal, the hospitals and infirmaries of London can be brought into immediate and effective contact with the urgencies of accident and illness; but it has at least pointed out some of the difficulties that beset this branch of hospital work and how they arise. The demand for inquiry was provoked by two things: street accidents in which undue delay was alleged in the arrival of ambulances after accidents; and urgent cases brought by ambulance to an institution not able to take them in, or not able to retain them for more than immediate treatment. No doubt there was frequent exaggeration in the descriptions of the circumstances—minutes feel like hours in the presence of tragedy; it is, however, beyond dispute that avoidable delay should be avoided and that cases of serious illness or injury should not be transferred from one institution to another in a vague and miserable *tournée* of disappointments. It is equally clear that the conditions of modern street traffic in a London which is crowded, huge, and rapidly extending, are largely responsible for a state of things which cannot be dealt with satisfactorily without drastic and expensive reorganisation. The Committee pointedly observes, "If we were engaged in planning an ideal arrangement for an urban community in which no previous provision existed, a scheme of suitably located casualty clearing stations adequately staffed might be devised, with motor ambulances, summonable by telephone, attached thereto, and equipped with a sufficient supply of casualty and observation beds." Even that would mean much money, but the actual circumstances to be met imply still larger sums. In order to deal satisfactorily with all sudden or accidental emergencies in the London of to-day, there must be large sums spent on providing beds, staffs, and ambulances for that express purpose, without regard to the fact that at times a proportion of such material will not be in use and will seem superfluous.

Although delay in the arrival of ambulances seems to have contributed to the holding of the inquiry, the Committee was not by the terms of its reference concerned with the question of the adequacy and efficiency of ambulance provision. It states, however, in passing that the area within the County of London, with recent and prospective additions to the service, appears to it to be well supplied, but that in the neighbouring areas there would seem to be need for better provision. The Committee had actually to inquire as to cases of inability on the part of the first institution sought to accommodate the patient brought to it for treatment, and as to other cases in which the patient had, before his cure was complete, been transferred elsewhere. This, of course, occurs in many instances in which a voluntary hospital, owing to the case not being suitable for retention in its wards, seeks to pass it on to a Poor-law infirmary which may, or may not, be willing or able to receive it. Poor-law institutions naturally have their limitations and regulations, and are primarily provided by the ratepayers of a defined area for the treatment of patients whose normal residence is within that area. The Committee therefore found itself confronted with a complicated state of things in which voluntary hospitals and Poor-law infirmaries, unsystematically scattered over the metropolis, receive under different regulations or practice cases of accident and illness occurring in streets and public places, generally handled in the first instance by the police controlled by the Home Secretary, and mostly conveyed by a municipal ambulance service. The position is complicated by diversity of practice obtaining in Poor-law infirmaries, by there being more than one ambulance service within the county, and by the police area of London covering portions of Middlesex, Surrey, Kent, Essex, and Hertfordshire outside the area of the County of London. The task of coördinating these services cannot be an easy one, and the question of ways and means for improvement must be prominent in any discussion with regard to it. The Committee is definitely of the opinion that the proposal that daily reports of vacant beds should be supplied to police and ambulance authorities is not practicable, and that even if it were so it would not prove to be of any real service or advantage.

The concrete recommendations of the Committee in the circumstances are to the effect that King Edward's Hospital Fund, in making its annual grants, should take into consideration whether hospitals, which deal with cases of accident or sudden illness occurring in streets or public places, provide a reasonably sufficient number of beds for such cases, and a reasonably sufficient number of beds, or observation beds, attached to the casualty department, in order to avoid, as far as possible, transfer to another institution of any patient whose condition might be prejudiced by such transfer. Here particular notifications to the police and ambulance authorities would be serviceable. They should be provided with lists which would indicate the institutions able to accommodate the cases in question, the lists being made up by the coöperation of the Ministry of Health in the case of Poor-law institutions and of King Edward's Hospital Fund in the case of voluntary hospitals. The intervention of the Minister of Health is considered necessary clearly in order to secure funds where needed, in cases where the Poor-law infirmary might consider the patient not to be entitled to its aid at the expense of the rate payers who provide the institution; for the Committee advises that in the cases under consideration, including cases transferred, no question should be raised by the infirmary as to the place of residence of the patient, as to where the accident took place, or as to the site of the transferring hospital; in other words, the charge for treatment of such cases should be a common Metropolitan one, and should not fall on the union receiving and treating such patients. A further very proper recommendation is to the effect that no disability should arise out

of technical pauperisation through a patient of the class indicated being treated in a Poor-law institution. The recommendations made therefore may be summed up as advising the use side by side of beds in voluntary hospitals and Poor-law infirmaries for the reception of accident cases and cases of illness occurring suddenly in public places, with recognition of the difficulty in present circumstances of keeping vacant at all times beds for the reception of such cases. There is further recognised the fact that the prolonged treatment of all cases brought to a hospital by ambulances is not possible consistently with the hospital rendering the best service possible to the community. Some cases have to be transferred to Poor-law institutions in order to make room for patients who will find their best hope of recovery in the hospital, or whose condition renders them best adapted for the purposes of a hospital where there is a medical school. That transfers are not to be made where the patient is likely to suffer in consequence follows as a matter of course.

The report of the inquiry, in the course of which the closing of wards for lack of funds at some hospitals was mentioned, should go far to convince the public that only want of money prevents the hospitals of London from performing to the full their share in the task of providing for street accidents. To keep vacant beds for accidents which may not occur must risk the withholding of hospital treatment for a person who without it will have no chance of recovery, although his or her condition is not due to accident. It seems clear, therefore, that beds for accidents must be provided specifically and kept vacant for that purpose alone. The hospitals ask, "Who will provide them?"

ALCOHOL AND LONGEVITY.

IN the new edition of the official publication on "Alcohol and its Effect on the Human Organism" [1] each chapter has been subjected to revision, a new chapter on alcohol as a medicine has been added, and the publication can claim to comprise in nearly every particular a dispassionate and judicial summary of the drink problem on its scientific side. It can scarcely claim the remarkable lucidity of exposition of Prof. E. H STARLING'S book on "The Action of Alcohol on Man," though it is well written; but it purposely avoids appeal to other than scientific considerations; and in its preface, referring to Prof. STARLING'S discussion concerning the social value of alcohol, the very proper comment is made that these discussions "are at present, and are long likely to be, matters for individual judgment and opinion rather than for scientific decision." In this wider world, the man in the street, the social worker, or the hygienist anxious to remove one of the most serious causes of poverty and sickness as well as of vice and crime, is as much entitled to a hearing as the physiological investigator. The chapter in the new edition likely to be most discussed is that dealing with the influence of alcohol on longevity. Until recently the discussion on this point has turned chiefly on the experience of the United Kingdom Temperance and General Provident Institution. This experience showed that among males insured for whole-life policies 26·4 per cent. fewer deaths occurred among the abstainers than would have taken place had they died at the rate observed in the class of non-abstainers. This was so, although the non-abstainers had a mortality almost identical with that of the average of persons insured in 23 British offices. There are many causes besides alcoholic habits which may have contributed to this difference, and on the whole the matter is fairly summarised in the chapter in question, although everyone may not agree with the cautious decision that "we cannot regard the experience of the office as conclusive," especially in view of the full actuarial details given 20 years ago by Mr. R. M. MOORE.[2]

New matter in this chapter embodies a summary of Prof. R. PEARL'S contribution to Prof. STARLING'S book. This gives evidence based on a continuous record of the alcoholic habits of some 2000 persons in Baltimore, who had died after reaching the age of 20 years. These persons were classified into (1) total abstainers throughout life; (2) moderate or occasional drinkers, including persons who might only very occasionally take a single glass of beer or wine; and (3) heavy or steady drinkers, including both drunkards and daily steady drinkers in however moderate amount; and it was found that the mean age at death among male members of group 1 was 60·05 years, of group 2, 61·04 years, and of group 3, 55·37 years. We share the regret expressed in the Medical Research Council's booklet that Prof. PEARL adopted the above method of classification, "which deprives us of nearly all the benefit which we had hoped to derive from his admirable material." No one would argue that an occasional glass of wine or beer would appreciably shorten life. On the other hand, no one doubts that intemperance shortens life. What we really need to know is whether the daily moderate (carefully defined) use of alcohol influences duration of life. As stated in the chapter from which we quote, the real problem is, "are a daily pint or two of beer or a daily bottle of claret, or a few glasses of whisky-and-soda per diem harmful?" and family histories carefully collected ought to throw light on this question. But at this point doubt is raised as to whether the "material," the statement of which, with less interesting statistical material, fills about one-fourth of Prof. STARLING'S work is "admirable"; and severe criticism of its value is comprised in a recent article[3] by Prof. HARALD WESTERGAARD, the distinguished statistician of Copenhagen, which has reached us. Prof. WESTERGAARD points out that the Baltimore statistics deal only with the persons in the experience collected who had died, and take no account of those still living, thus ignoring the greater part of the total persons at risk in the experience. On this basis Prof. PEARL is obliged to assume that the mean age at death of persons in each of his three groups who have died at ages 20 and over gives a fair basis of comparison between these groups. But, even if on other grounds this method of statement were wise and trustworthy, a preliminary objection to it arises. In view of the steadily increasing temperance propaganda younger men are likely to be total abstainers in larger numbers than older men; hence it follows that, other things being equal, deaths among total abstainers will be at an earlier age than deaths among non-teetotallers. This makes it all the more noteworthy that with such a test the vitality of abstainers should have been greater than that of steady drinkers. The method in itself is, however, essentially unsatisfactory. It is described by Prof. WESTERGAARD as "quite obsolete and misleading." Many years ago an investigation by the same method

[1] Alcohol and its Effect on the Human Organism. New edition, revised by the Medical Research Council. H.M. Stationery Office. 1s.

[2] Journal of the Institute of Actuaries, Nov. 30th, 1903.

[3] Reprinted from the International Review against Tuberculosis, 1924.

undertaken by the British Medical Association showed a mean age at death of abstainers of 51 years and of the habitually intemperate of 63 years; and official disclaimers against the obviously illegitimate inference drawn from these figures did not prevent their display in public-house windows as valid evidence that drunkards live longer as well as merrier lives than teetotallers!

The same method was exposed repeatedly by WILLIAM FARR in the early reports of the English Registrar-General. It is a method which, by using illustrations, FARR reduced to absurdity. The mean age at death, he remarked, is not a factor to be trusted; for were this test accepted—as he wrote in the Fifth Annual Report of the Registrar-General—it would be necessary on behalf of the young but early dying cornets, curates, and barristers "to make them generals, bishops, and judges for the sake of their health." Although the Baltimore figures do not diverge widely from what were probably the actual facts—like the extreme illustrations cited above—confidence cannot be accorded to results thus obtained. The right method of investigation is to observe a certain number of living people during a certain number of years, which can be done retrospectively, the fate of each person whether dead or still alive being set down, and death-rates recorded from which, if desired, the actuarial expectation of life can be calculated. Our knowledge has not been increased by the Baltimore figures, and they lend themselves to misleading quotation. The experience of insurance societies, when fully analysed, points to the superiority of the life-prospects of teetotallers over moderate drinkers, among whom there would admittedly be a small proportion of intemperate persons. This experience should be considered in conjunction with the physiological and pathological facts as to the action of moderate doses of alcohol, given both in the publication of the Medical Research Council and in Prof. STARLING'S book, when the conclusion will be justified that abstinence from alcohol is a valuable means for prolongation of life and promotion of efficiency.

THE SIZE OF INFECTIVE VIRUSES.

THE attempts which have been made from time to time to simplify the administration of fever hospitals by one or another form of "bed-isolation" have led to information which is of some interest in connexion with the question of the unidentified (or, at any rate, unseen) agents which cause some of our common infectious diseases. Chicken-pox needs a barrier of the order of the wall of a room, measles spreads easily from bed to bed; in both cases the volatility of the infection is greatest in the first two or three days. Everything else seems fairly safe to manage in a common ward with not too much crowding and a well-trained nursing staff. One thing is certain—that there must be plenty of room. The density of the infectious agent may be assumed to vary inversely with the square of the distance from its source. Under conditions of serious overcrowding, diphtheria, meningitis, and influenza will spread quite freely, whereas under reasonable conditions of space they are by no means highly catching. Apart, however, from this circumstance, the facts suggest several possibilities about the nature of the viruses. It may be that the cause of chicken-pox is viable for a longer time outside the body than that of scarlet fever; of known pathogenic bacteria the gonococcus is an example of how little a complete parasite may be able to tolerate the conditions in the outside world. But other evidence is against this being an important factor, since there are good grounds for believing that the cause of scarlet fever may live outside the body in an infective state for at least several days, and less frequently a prelude to infection than with chicken-pox.

Size of the virus may be an important consideration. It is a striking thing that the two diseases of known ætiology which are caught so frequently by those who work with the bacteria that a practical nuisance arises—Malta fever and tularæmia—are both caused by exceptionally small, though plainly visible, organisms. Rocky Mountain fever and typhus are quite dangerous too, but in both there is a special insect vector as well as a very small organism. From which we get support for the idea that the causes of chicken-pox and measles are also very small—much smaller, that is, than bacteria like the diphtheria bacillus or the meningococcus. In the case of measles, at any rate, there is other evidence that the cause is small or has a small phase in its life-history. The floatability or volatility of particles obviously depends greatly on their size and specific gravity. The latter is presumably not very widely different through the whole series of live organisms. Down to a diameter of about 1μ particles in air behave like pieces of solid matter. The limit of microscopic vision is somewhere about 0·25μ, and a particle as small as 0·1μ has so much surface relative to its mass that its properties are no longer directly in line with those of similar larger bodies. It fails, for example, to obey Stokes's law for falling bodies, which is direct evidence that it would be particularly liable to float about in air even longer than would be expected from its size. It is quite unknown how big the invisible viruses which will pass the pores of a fine porcelain filter really are. Experiment indicates that some of them are no bigger than a molecule of hæmoglobin—an almost incredible conclusion. But if they were ten or a hundred times larger they would still have an exceptional carry through the air. When the viruses are known and measured, it will be interesting to see whether the possibilities of bed-isolation can be calculated in terms of colloidal ballistics.

GLASGOW ROYAL INFIRMARY: THE LISTER WARD.

THE demolition of the old block of the Glasgow Royal Infirmary, of which the Lister Ward forms the ground floor, is proceeding apace, but the lay press of Glasgow continues to pay considerable attention to the whole question of the retention of the fabric. On March 26th the Presbytery of Glasgow passed a motion "strongly protesting against the proposed destruction of the ward, and expressing the hope that it may be possible to retain it as a memorial of Lord Lister and his great work in the infirmary." A similar protest has been made by the employees of at least one large city firm; and protests from interested individuals have been numerous. The level of the adverse criticism shown in these discussions and letters has been very uneven, and in some cases quite different issues have been introduced and discussed. The managers of the infirmary, however, continue to pursue the policy upon which they originally decided, and which was ratified at the annual meeting of subscribers. It has been suggested that their refusal to be influenced by the press and scientific and corporate bodies must have an adverse influence upon the income of the infirmary. We cannot think that this will be so. The routine work of a great infirmary must go on, and to curtail its beneficent activities by wilfully reducing its income would seem to us but a poor way for those who disagree with the managers to show their displeasure.

Annotations.

"Ne quid nimis."

PROVISION FOR DEFECTIVE CHILDREN IN LONDON.

THE Education Committee of the London County Council have published a descriptive pamphlet[1] explaining the variety and nature of the provision offered for the education of defective children of all kinds. This provision has steadily increased since the commencement made by the old School Board for blind and deaf children in 1893, and it now covers all forms of disability. Experience has shown that difficulty still arises from the lack of public information on this subject; sometimes children who could benefit fail to attend as early as might be wished owing to their parents and advisers being unaware of the existence of educational facilities other than those of the ordinary elementary school. The special schools also serve as a link in the chain of after-care and medical or surgical supervision. The care committee organisation attached to each school endeavours to ascertain through the hospital almoners the frequency with which the members of the clinical staff wish to see their patients so as to secure their attendance at the prescribed times. Also they arrange that after periods at convalescent homes or residential institutions the children shall resume attendance whenever necessary at their hospital of origin, thus diminishing the change of venue which is often a source of confusion. While in the schools the children are under the supervision of a specialist medical staff who see them from time to time and advise as to return for treatment. In the intervals any child can be seen by a member of the general staff of school doctors. This procedure has the advantage of securing the return for treatment in many cases in which the parents, left to act on their own judgment, might delay longer than is advisable. The curriculum at each type of school has been thought out specially to meet the difficulties of particular defects and to prepare, at the later ages, for some definite occupation: while the after-care committees assist in placing out former pupils and in keeping a general supervision over their welfare up to the age of 18. In the case of the schools for cripple children, conveyance by ambulance from the home to the school and back is arranged and a fully trained hospital nurse is in attendance throughout the school hours. Children are admitted to special schools only on the certificates of medical officers on the staff of the Public Health Department of the L.C.C. who have been recognised by the Board of Education for the purpose, and to whom all information received is transmitted. We understand that Sir William Hamer, school medical officer for London, welcomes the fullest coöperation with hospital staffs and would gladly exchange information with regard to children or receive suggestions for their welfare emanating from the physicians and surgeons under whom they have been treated. An appendix to the pamphlet gives a reference list of the special schools, nearly 200 in number, which form part of the L.C.C. education service.

[1] London County Council: Notes on the Provision made in London for the Special Education of Ailing or Defective Children, from a Medical Point of View. P. S. King and Son, Ltd. 3d.

PARTIAL GASTRECTOMY: A RETURN TO BILLROTH I.

IT is becoming increasingly evident that medical science is in danger of over-specialisation; the various branches are developing more and more into watertight compartments, and the student on completing his preliminary studies is apt to regard them with a sigh of relief as a closed book. Anatomy and physiology are forgotten, while surgery is proceeding along the lines of brilliant technical achievements rather than upon the conservation of function. No better example is needed than the surgery of the stomach. In the collected papers of the Mayo Clinic, Vol. XIV.,[1] an extensive section is devoted to the surgery of the stomach, and there are many papers on gastric and duodenal ulcers and carcinoma, which must prove of great value to any surgeon who is confronted with these conditions in his routine work. The history of the treatment of the peptic ulcer is probably more remarkable than that of any other single condition. For many years the discussion has continued, and as time passes the question of the treatment of the peptic ulcer provides an evergreen subject for the programmes of the greater and the lesser medical societies. The surgeon having in any given case persuaded himself and the physician and the patient that active surgery alone holds out any hope of permanent cure, is then confronted with a bewildering variety of methods, the gradual trend of opinion being in favour of certain operations of greater and greater magnitude. The conclusion must be fairly obvious, for the very complexity of the whole subject surely points to dissatisfaction with the results. It is now conceded by the majority of serious surgical investigators that no one method is applicable to ulcers of every type and in every situation. This point of view is admirably dealt with by William J. Mayo in his paper on Radical Operations on the Stomach. There is no gainsaying that many ulcers and many carcinomata of the stomach will demand a partial gastrectomy. It will be remembered that the early cases of this operation were invariably completed by an end-to-end anastomosis of the stomach and duodenum, the pioneers in this work being Pean (1879), Rydygier (1880), and Billroth (1881). The anatomical conditions imposed upon these surgeons the problem of anastomosing a duodenum of small calibre to a much larger stomach. The disparity in size was reduced by stitching up the stomach until an area was left corresponding in size to the cut end of the duodenum. The result was the production of the "fatal suture angle" which in itself was sufficient to cause this operation, which had come to be known as the Billroth I. operation, to fall into disfavour and even into disuse.

Simple gastrojejunostomy, the Polya and Billroth II. methods of partial gastrectomy, are admirable technical achievements and are undoubtedly demanded by certain anatomical and pathological conditions, but it cannot be denied that they result in grievous disturbances of physiological function. The return to the Billroth I. operation is a return—as near as may be—to physiological conditions, and its steady restoration to favour is an indication that the surgical profession as a whole is alive to the evil results of the severe impairment of gastric function. It only remains to prove that the original defects of this operation have been overcome and to appreciate how this result has been achieved. Shoemaker has demonstrated that under modern technique leakage does not occur at the suture angle, and that quite a large extent of the lesser curvature and the pylorus can be removed, at the same time leaving a large area of stomach behind, permitting an end-to-end anastomosis of stomach and duodenum. Mayo emphasises the vital importance of the thorough mobilisation of the lesser curvature, and draws attention to one serious complication—viz., the dropping back of the stomach to the left of the spine—thereby putting an undue strain on the anastomosis, and impeding gastroduodenal drainage. He points out that this may be overcome by fixing the anterior wall of the stomach to the suspensory ligament of the liver in such a way that the anastomosis is firmly anchored to the right of the spine. With attention to such details of technique, Billroth I. has once again become the operation of choice, and has in addition this great point in its favour, that the normal physiological and anatomical conditions are reproduced as nearly

[1] London and Philadelphia: W. B. Saunders Co. 1923. Pp. 1394. 63s.

as is compatible with the removal of the damaged area. In those cases, however, in which too large a portion of the stomach has to be removed, as in some cases of carcinoma, then the nearest approach to the restoration of physiological conditions is Moynihan's modification of the Polya method.

BROKEN GLASS AS A POISON.

RECENT correspondence in *Municipal Engineering* has voiced the anxiety of its readers in regard to the presence of broken glass in their food, the possibility especially of appendicitis and cancer arising being emphasised. No doubt the frequency of these two diseases affords the reason for their rather arbitrary selection. We are not prepared to deny that broken glass can produce appendicitis, as the multitudinous variety of foreign bodies found in an inflamed appendix includes glass particles, but to suggest broken glass as a common cause of appendicitis lacks foundation entirely. As a cause of cancer broken glass is not worthy of discussion. Judging from this correspondence, however, the use of glass containers for sterilised food is on the increase, and certain results are known to follow. 1. As one manufacturer of jam points out, bubbles of air in the wall of the glass container, especially if close to the internal surface of the jar, may burst, causing flakes of glass to become detached and pass into the food when it is poured hot into such a jar. 2. Glass jars are moulded by machinery, and when the two halves of the mould do not fit tightly together glass is squeezed out into thin plates at the seams. When hot food is poured into such jars, these plates of squeezed-out glass become detached. 3. During the pouring of the hot food into the jars—which are often of inferior glass—the whole container may fly, and the food, instead of being discarded, is strained through sieves which do not prevent the smaller particles from passing through with the food. Regarding the alleged poisonous effects of powdered glass, it is not without historical interest to note that Dr. W. Johns, F.R.S., writing in THE LANCET of Feb. 19th, 1825, recommended the use of pulverised glass as an efficient vermifuge. In his article he stated that he had used this substance for many years on children and adults with uniform success, giving two scruples every day for a week, followed by calomel for children. In the Middle Ages powdered diamonds were used to produce sickness and death, and Benvenuto Cellini in his autobiography records that such an attempt was made on him, but the individual instructed to powder the diamonds substituted another substance so that no ill-effects resulted. Coming to more recent times, in the Baroda case diamond dust was administered with arsenic in sherbet. The effect of swallowed glass depends, of course, upon the size and sharpness of the particles—a large fragment will produce the same symptoms as any other sharp foreign body; the fine particles appear to have very inconstant results. On the one hand, there are authentic records of professional glass-eaters who have practised many years for gain; ultimately, as far as is known, these succumb to the effects of their calling, usually from some form of gastro-enteritis. Their feats are generally performed on a full stomach. On the other hand, in India powdered glass is not infrequently administered both to human beings and to cattle with intent to kill—in either case with some success. Glass bangles obtained from the bazaar and powdered have been administered in curry, and in some Oriental cities rat-catchers are said to employ this substance for destruction of vermin. In this country the employment of powdered glass is very rare, but recently it has been mentioned twice. In one case the food with which it was mixed was not eaten, and in the other case the employment was suggested, but there was no proof that it was ever used. The symptoms produced by powdered glass are in the main due to damage to the mucous membrane of the alimentary canal, and resemble those of gastro-enteritis. Pain may or may not be present. There is usually nausea and vomiting, and the vomit is often streaked with blood. Passage of the stool is painful and the fæces may contain blood. Perforation of a viscus has occurred. If the patient recovers—and the majority do recover—a chronic gastro-enteritis may ensue. The post-mortem appearances have shown considerable inflammation of the alimentary tract, with erosions, ulceration of the organs, and a considerable quantity of blood mixed with the contents. In cases where suspicion arises, great care must be taken to distinguish small particles of glass, and any organs reserved should not be placed in glass vessels. Analysis for powdered glass is simple: the organs are treated with hydrochloric acid and potassium chlorate, whereby the organic matter is destroyed and goes into solution, whilst any glass present is untouched. Filtration and examination with the naked eye or microscopically will then reveal the presence of particles to which confirmatory tests can be applied. With regard to the use of glass containers for food products, we recently pointed out their inferiority to metal containers in the matter of ready sterilisation: tins can more readily be made air-tight. Greater trouble in transport, loss from breakage, and the risk, whatever it may be, from ingestion of broken particles, may well turn the scale against the use of glass for food containers in this country.

PRE-OPERATIVE DIAGNOSIS OF EMBOLISM OF A RENAL ARTERY.

SOMETIMES logical reasoning and sometimes happy intuition which is little more than a guess, give a surgeon the clue to the correct diagnosis in a difficult case. The following case illustrates the felicity of a combination of clear reasoning powers with what can be best described as an inspiration. One morning Prof. P. Bull, who tells the tale,[1] found in his wards a woman, aged 35, who had been admitted on the previous day with the diagnosis of "acute abdomen." She was a domestic servant who gave no history of heart disease, rheumatic fever, or other illnesses, and who had been seized on the evening previous to her admission to hospital with violent pain in the upper abdomen. The following night was spent in pain and incessant vomiting. When examined next morning her medical attendant found rigidity and tenderness in the upper abdomen, and he very naturally suspected perforation of a gastric ulcer. In hospital the rectal temperature was found to be 38·1° C., the pulse 64, the respirations 28. A faint presystolic murmur was heard over the apex of the heart, and the second pulmonary sound was accentuated. The tenderness in the upper abdomen was greatest under the left costal arch. The catheter urine showed no pus cells, blood cells, or casts. The last menstruation had occurred five weeks earlier. These were the salient features presented to Prof. Bull when he first saw the patient, and when he proceeded to discuss with a class of students the differential diagnosis. As he ran over the various possibilities such as perforated gastric ulcer, intestinal obstruction, renal calculus, the suspicion suddenly occurred to him that the presystolic murmur and the sudden, acute abdominal pain might be relevant to each other. Wondering if the heart disease might not have given rise to embolism of the left kidney or renal artery, he catheterised both ureters and found that the left kidney had practically ceased to function. The injection of indigo-carmine told the same tale, and while the specific gravity of the few drops of urine drawn from the left kidney was only 1013, it was 1023 on the opposite side. With this and other evidence to support his diagnosis of embolism of the left renal artery, he performed nephrectomy and found the three main branches of the renal artery blocked by emboli, and the kidney itself mottled and the seat of numerous large infarcts. Death occurred suddenly 16 days after the operation, and again Prof. Bull scored a diagnostic success. He anticipated and found at the post-mortem examination that the mitral

[1] Nors: Magazin for Lægevidenskaben, March, 1924.

valve was obstructed by a large thrombus which had evidently become detached from the left auricle immediately before death. Thanks to the care with which the necropsy was performed, this thrombus was given no chance to slip back into the left auricle and thus puzzle all concerned as to the part, if any, it had played in causing the patient's sudden death.

DRUG IDIOSYNCRASY, WITH SPECIAL REFERENCE TO ADRENALIN.

THE term "idiosyncrasy" used in connexion with potent drugs denotes an imperfectly comprehended phenomenon. For example, a dose of chloroform which can be inhaled with safety by one individual will produce in another alarming or even fatal symptoms; the nature of these, ventricular fibrillation or vagal inhibition, may be demonstrated, but we have not the slightest knowledge which helps us to determine why the symptoms arise in one case and not in the other. The interesting communication from Dr. H. E. Symes-Thompson on p. 743, draws attention to idiosyncrasy in connexion with adrenalin and conveys a warning that may well be heeded. Adrenalin used in association with local anæsthetics is often not given credit for all the powers which it possesses. There has come down from the cocaine era a tendency to lay at the door of the local anæsthetic employed the blame for distressing symptoms which are actually due to the adrenalin injected and not to the anæsthetic. As long ago as 1910 Fröhlich and Loewi showed that intravenous injection of such a dose of cocaine into an anæsthetised cat as was by itself without effect produced a striking change in the pressor effect of a small dose of adrenalin. Before cocaine, 0·1 mgm. adrenalin produced a rise of pressure from 76 mm. to a maximum of 120 mm., having a duration of about two minutes; following 5 mgm. cocaine, the same dose produced a rise from 50 mm. to 140 mm., maintained during five minutes. Last year Sternberg showed that the same phenomenon followed the injection of novocaine and alypin, and he made it thereby clear that the action of cocaine was possessed by several local anæsthetics and was not dependent on some precise chemical structure. Another quite unlike substance having a similar effect is pituitary extract; when the rise of blood pressure produced by its injection in the pithed cat has passed off the effect of adrenalin is again much greater than before. More profitable comment may be made on the symptoms produced in the clinical cases recorded. It is natural to think that the effect of adrenalin is exerted peripherally and that the heart "consciousness," rise of blood pressure, sweating, and so forth, result from stimulation by the adrenalin of the sympathetic nerve-endings. It is unlikely that this is the case. In the cat an intravenous injection of adrenalin produces sweating on the pads of the feet, but not if the peripheral sympathetic nerve has been cut. Hence in this case the action of the adrenalin must be central rather than peripheral, and the stimulation it produces may follow as a consequence of central anæmia produced by the vaso-constriction. The possibility that idiosyncrasy to adrenalin is related to excessive thyroid activity also has experimental support, and as the evidence for an inter-relation becomes quantitative it becomes more acceptable. Holm and Bornstein have recently showed, for example, that the rise of blood-sugar produced by a dose of adrenalin in the rabbit is much less after thyroidectomy. All this points to the desirability of using adrenalin in very minute amounts, or, rather, in very dilute solution. Braun, whose authority in this matter is unimpeachable, regards a strength of 1 to 100,000 or 1 to 200,000 as the proper dilution for use with local anæsthetics. It is probable that in cases of dental extraction a dilution much less than this is often employed. The especial risk of adrenalin injection in association with light chloroform anæsthesia is now, of course, well recognised. When the two drugs are to be employed in the same case the injection must be made before the anæsthetic is begun or else after the patient is in deep narcosis. Whether suprarenin, a synthetic product, or adrenalin, the organic extract, is employed does not necessarily make any difference, for some of the suprarenins manufactured are equal in potency to natural adrenalin.

POST-SEROTHERAPEUTIC AMYOTROPHIC PARALYSIS.

THE list of sequels to the injection of a serum is already fairly long, and it has hitherto been customary to classify them in two main groups, according as they are early or late. Anaphylactic shock, for example, is an early sequel, whereas a rash, pain in the joints, albuminuria, œdema, myalgia, diarrhœa, and vomiting are a few of the many comparatively late sequels. Common to both groups is the fact that, provided the patient does not succumb at once, these reactions are only transitory, no permanent injury being inflicted. Unfortunately, the condition described as post-serotherapeutic amyotrophic paralysis is distinguished from the well-known sequels to serotherapy by its obstinacy, not to say permanency. Dr. J. Lhermitte records in detail[1] three cases observed during the war. The patients were soldiers given subcutaneous injections of antitetanic serum soon after being wounded and as a routine prophylactic measure. In no case could the dissociated amyotrophic paralysis of the brachial plexus which ensued be traced to the wounds for which the serum was given, nor to syphilis nor rheumatic disease of the vertebral column. The paralysis developed on the fourth, fifth, and eighth day respectively after the injection. The muscles involved were those of the shoulder and upper arm. The onset of the paralysis was associated with acute pain in the scapular and shoulder regions, but the pain passed off without leaving any tenderness on pressure over the branches of the brachial plexus or sensory disturbances. Apart from the amyotrophic condition, there was no trophic disturbance with the exception, in one case, of hypertrichosis of the posterior surface of the forearm. The paralysis did not pass off completely, and the amyotrophic condition seemed to be more or less permanent. After reviewing the recent literature on the subject, Dr. Lhermitte notes as significant that, with the exception of a single doubtful case in which antidiphtheritic serum was given, the cases hitherto recorded arose in connexion with the administration of antitetanic serum. This observation would suggest that antitetanic serum may, under certain conditions, have a toxic affinity for the nervous system whether the patients injected have, or have not, been sensitised by previous injections. The cases of amyotrophic paralysis observed in connexion with injections of antitetanic serum are obviously so rare that, interesting as this condition is, there is no need to regard it as an indication to withhold specific serum treatment in a case likely to have been infected by the tetanus bacillus.

THE PIRATES' WHO'S WHO.

IN this amusing book[2] Dr. Philip Gosse gives particulars of the lives and deaths of the well-known pirates and buccaneers whose names occur in history, romance, or both; in the latter case the achievements not always being borne out by Dr. Gosse's well-documented little biographies. Kidd, to whose terrific exploits the hidden treasure in the adventure story so often owes its accumulation, appears to have been not only a third-rate performer along incorrect lines, but largely a lawful and legal privateer, who was made the scapegoat of patrons like the first Earl of Bellamont (not Bellomont as in the book), the Duke of Shrewsbury, and other highly-placed persons with a keenly developed money sense.

Who is to be described with accuracy as a pirate is considered by Dr. Gosse in an informing preface, and the difficulty is apparent when we find Paul Jones

[1] Paris Médical, March 8th.
[2] London: Dulau and Co. 1924. Pp. 238. 10s.

included in the piratical book of reference, though with the statement that no one would to-day call him a pirate, and Sir Francis Drake excluded, though the author admits that he cannot exactly remove his earlier exploits from the designation of piracy. A piquant little biography is that of Captain Ben Johnson, the English midshipman, who deserted in the Red Sea, and proved so clever a sailor that he became admiral of the fleet of 14 vessels belonging to the Sultan of Ormuz. Johnson became a convert to Brahmanism, collected a crew of Englishmen round him of similar flexible religious tenets, held up English shipping, sacked towns, raided temples, and took vast plunder back to his oriental employer. But wearying of service he decided to strike out for himself, and ran away with the best vessel in the Ormuz fleet, a selected crew, and some £800,000, with which he reached Constantinople in safety. Indeed, he was received with acclamation, was made a Bashaw, and, says Dr. Gosse, "at the end of a long life of splendour died a natural death." Two of the longest biographies are those of Sir Henry Morgan and Captain Misson, both of which illustrate the broad range of the subject. Sir Henry Morgan was certainly a buccaneer, but he was also a privateering organiser with a legal status, which was afterwards recognised by his knighthood and appointment as deputy governor of Jamaica. Captain Misson was a religious and chaste pirate, who was for a time broken-hearted at the "death" of the captain of an English vessel from which he had taken £60,000; he married a native of the island of Johanna, a sister of the local queen, and founded a colony on socialistic lines of which he was elected Lord Conservator. He was a moral and religious person, and seems to have deserved better of fate than to be driven into the sea by the natives who rose against being conserved.

There is a considerable literature of piracy to which Dr. Gosse calls full attention, but many of the volumes are rare and difficult to come by, consequently this alphabetical list will be found very useful. The author is to be congratulated on the original form in which he has given shape to his studies.

INFECTIOUS SCLEROMA IN CZECHO-SLOVAKIA.

IN a recent communication to the Committee of the International Office of Public Health, Dr. Joseph Cisler, professor of rhino-laryngology in the Czech University of Prague, stated that scleroma of the nose and throat was more frequent in Czecho-Slovakia than in Western Europe, and was steadily increasing in frequency. Of 75 cases of which he had received reports from various otological, laryngological, and dermatological clinics throughout the Republic, 53 had occurred in Bohemia, 14 in Moravia, 6 in Slovakia, and 2 in Subcarpathian Russia. The chief country of origin of scleroma is Poland, from which the disease has extended westwards to Silesia, Moravia, and Bohemia, southwards to Hungary, Croatia, Styria, and Carniola, eastwards to Russia, in the north-east to Lithuania, and in the north-west to Prussia. Poland, however, is not the only source of scleroma, as sporadic cases have been seen in all parts of the world, including Switzerland, Southern Italy, where it is endemic, Spain, Egypt, India, Japan, Oceania, and North and South America. The question of infection and contagion has not yet been satisfactorily settled, as the disease has not been experimentally inoculated into man or animals. Several cases, however, have occurred in the same family, and the fact that soldiers contracted the disease in Poland and Russia during the war is further evidence of its infectious nature. Of Dr. Cisler's 75 cases 36 were in men and 39 in women; the ages ranged from 16 to 69. Although formerly scleroma occurred only in the lowest classes of society, the rich are not exempt, as three cases in the present series were in well-to-do persons. The progress of the disease is very slow. The prognosis depends on the extension of the morbid process to the lower respiratory tract. Death was usually due to pneumonia, but in some cases which ran a rapid course the cause of death could not be discovered and was probably asphyxia. Treatment consists in systematic dilatation of the affected parts. Owing to the infective character of the disease vaccine treatment with Frisch's rhinoscleroma bacillus has been employed. Vymola has found that vaccination of this kind prevents the formation of fresh infiltrations. The more recent the lesions the more certain is the curative effect of vaccine treatment.

[1] Bulletin de l'Office Internationale d'Hygiène Publique, 1924, xvi., 60–69.

SARCOMA OF THE PENIS.

Dr. James J. Joelson,[1] of the Urological Clinic of the Peter Bent Brigham Hospital, Boston, who records an illustrative case, states that only 35 examples of sarcoma or endothelioma of the penis could be found on careful examination of the literature. One of these was described as a fibro-cellular tumour, 2 as fibro-sarcomata, 2 as spindle-cell, 4 as mixed-cell, 7 as round-cell sarcomata, 8 as melano-sarcomata, and 9 as endotheliomata, while 2 were not classified. The great majority occurred in men of the cancer age, but four were in younger adults, one in a boy of 8 years and two in infants. The commonest symptoms were pain in the penis or perineum, dysuria, and occasionally acute retention of urine. Most of the cases of endothelioma had priapism. Dr. Joelson has classified the cases into four groups according to their degree of malignancy. In the first group, which are the least malignant, the tumours do not metastasise freely, but tend towards formation of local recurrences which arise from the corpora cavernosa, less often from the sheath of the penis than from the erectile tissue. The second group, consisting of round-cell sarcomata, the great majority of which originate from the corpora cavernosa, are more malignant than the first group and show earlier and freer metastases. The third group, consisting of melano-sarcomata, though they metastasise freely, do not grow as rapidly as round-cell sarcomata. In all these cases the tumour arises at the distal end of the penis either in the glans or the prepuce. In the fourth or largest group, which consists of endotheliomata, the tumours are very rapid and malignant in their growth. Dr. Joelson's case, which occurred in a man aged 57, was an example of the second group, the tumour being a fibro-sarcoma of two years' duration, in which two local excisions and a biopsy had been performed. No evidence of metastases was apparent. Eight months after complete extirpation of the penis with dissection of both groins there was no evidence of recurrence or metastasis.

[1] Surgery, Gynecology, and Obstetrics, February, 1924.

THE house and library of the Royal Society of Medicine, 1, Wimpole-street, London, W., will be closed from Thursday, April 17th, to Tuesday, April 22nd, both days inclusive.

WE regret to announce the death in London on April 6th of Dr. Alexander Haig in his seventy-first year. Some 40 years ago Dr. Haig's name became a household word in connexion with the part played by uric acid in the causation of disease.

AT the Council election next July of the Royal College of Surgeons of England there will be three vacancies, and the names of the eligible Fellows who are candidates follow in order of seniority: Mr. W. McAdam Eccles (formerly a member of the Council), Mr. W. E. Miles, Mr. H. J. Paterson, Mr. T. P. Legg, Mr. A. H. Burgess, Mr. Victor Bonney, Mr. Wilfred Trotter, Mr. Philip Turner, Sir Charles Gordon-Watson, Mr. Hugh Lett, and Mr. G. Grey Turner.

Modern Technique in Treatment.

A Series of Special Articles, contributed by invitation, on the Treatment of Medical and Surgical Conditions.

LXVI.—THE TREATMENT OF HÆMORRHAGE FOLLOWING TOOTH EXTRACTION.

IT is time that the procedure adopted for hæmorrhage in general surgery should be applied to a similar condition following the extraction of a tooth. The usual description of the condition given by the patient conveys the impression of great discomfort and anxiety. The bleeding had "lasted all night," and, in spite of keeping quiet by lying down and making applications of cold water or styptics of different kinds, large clots of blood formed in the mouth, and blood and saliva, the latter increased in quantity, continued to flow from the mouth, soaking many handkerchiefs (the number of times being given); sometimes there is given a volumetric measurement of the amount of blood presumably lost—e.g., "at least a pint."

The Disadvantages of "Plugging the Socket."

The doctor is sent for, and, finding further local applications such as adrenalin and ice useless, feels compelled to adopt the classical method of treatment by "plugging the socket," a procedure he delays for as long as possible on account of the great pain and discomfort caused. At first it not infrequently fails, and the operator, thinking perhaps it is due to tenderheartedness on his part, or to the want of courage on that of the patient, makes a more heroic attempt. In due course the hæmorrhage is arrested, usually with considerable injury to the parts involved; more often than not a varying degree of necrosis results, the soft tissues become swollen, and there is practically always some sloughing. Such a picture may be regarded as an exaggeration, but from a considerable experience I venture to state that it is not uncommon, and my object in setting it out is to raise a protest against the method of plugging the socket in general use.

Precautions in Extraction.

In considering the question of treatment, it is necessary to determine what are the causes of the hæmorrhage, how it can be prevented, and if it occurs, how it can most easily be arrested. It practically never occurs if a tooth be extracted without laceration to the soft parts or fracture of the alveolus—the first principle, therefore, is to extract the tooth with as little damage to the tissues as is possible. An error, I believe, has been committed in teaching dental and medical students, by emphasising an outward movement during extraction, which frequently leads to fracture of the outer alveolar plate. It would be more correct to urge a loosening of the tooth, and then its withdrawal in its long axis. If, however, the character of the tooth is such that this method is impossible, and the alveolus is broken, the question of possible hæmorrhage should immediately arise in the mind of the extractor. Should it occur, the general surgical principle laid down of determining where the bleeding-point is situated applies equally in the case of a tooth socket. The hæmorrhage will be found in practically every case to be situated in the muco-periosteum, which has been torn from the bone (the margin of the socket usually having been fractured), and never from the socket itself. In those rare cases where the hæmorrhage comes from the bone, a large part of the socket has been removed in the effort to extract the tooth. Even in cases where so severe an operation has been necessary, it is improbable that a vessel of an appreciable size has been damaged. In the operation of removing some inches of bone from the iliac crest for bone grafts, hæmorrhage is at times persistent, but is overcome without difficulty by placing a blunt-ended instrument over the bleeding-point, and giving a gentle tap with a hammer. Such hæmorrhage, however, implies an operation scarcely within the category of ordinary tooth extraction.

An Alternative Technique for Stopping the Hæmorrhage.

The procedure for treatment in cases of hæmorrhage should be as simple as possible, and great care should be taken to avoid injury of the parts. The muco-periosteum should be turned back gently and any loose fragments of bone removed. Any difficulty in determining from where the blood is coming may be overcome by applying lateral pressure to the soft tissues of the socket, first to one side and then the other, sterile gauze being used for the purpose. Where a fragment of alveolus has been removed, and pressure is applied in this manner, the hæmorrhage in most cases is completely arrested. Should it recur on removal of the pressure, a roll of gauze upon which the patient can close the jaws is often effective, but the pad must be carefully applied so that pressure is brought to bear directly, or by tension on the gum, upon the bleeding vessel. Direct pressure applies particularly to hæmorrhage from the quite large vessels situated in the muco-periosteum around a third mandibular molar, a tissue which is apt to be torn from the bone during the removal of this tooth. With other teeth the bleeding-point is usually away from the upper part of the socket, when the muco-periosteum must be carried over the bone when applying the gauze. Should this procedure fail, one stitch through the gum, pulling the soft tissues together across the socket, will usually succeed, but if there is any doubt, greater security may be assured by a stitch commencing on the side which is not bleeding, then taken through the bleeding side, and back again through the same side, and then back through the original flap. The vessel may be included in the loop, but when this is impossible the tension will usually suffice.

Ligature of the bleeding vessel may be undertaken, but is difficult to carry out, as one is apt to increase the tearing of the flap. If the hæmorrhage is upon a free surface, there is little difficulty in arresting it, but when it is situated more deeply, there is considerable difficulty in applying artery forceps. If, however, the vessel needs the direct application of a ligature, this is best carried out by including it in the loop of the ligature, introduced with a curved needle.

Should the simpler methods fail, it is undoubtedly advisable to make a local injection of novocaine with or without adrenalin, in order to render it easy to carry out the treatment, and to avoid injury of the parts as much as is possible. If adrenalin is used, it is necessary to remember that when the action of the drug passes off the hæmorrhage may recommence.

In cases in which the clotting of the blood is imperfect, judging from the records available, hæmorrhage would appear to be of greater frequency after tooth extraction, than from injury to other parts of the body. How often do they occur during general surgical procedure? I would venture to state that they will be found to be of far less frequency than is generally implied if the hæmorrhage is dealt with in a surgical manner.

Summary.

The treatment may be summarised as follows:—

1. The removal of fragments of fractured alveolus.
2. Lateral compression of the muco-periosteum, which can be continued by the patient.
3. Compression between the jaws of a pad applied over, or making tension upon the vessel.
4. Tension derived from stitching the flaps of muco-periosteum over the socket.
5. Ligature or stitch at actual point of hæmorrhage.

I would add that the most important point of all is that during extraction of a tooth no laceration of soft parts or fracture of alveolus should occur if it can possibly be avoided.

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Special Articles.

SMALL-POX AND VACCINATION: DR. KILLICK MILLARD'S VIEWS.

BY JOHN C. MCVAIL, M.D. ST. AND., LL.D., F.R.F.P.S.

IN his writings on the subject of small-pox and vaccination Dr. Killick Millard has related how in his early days he lectured and conducted a newspaper controversy in support of vaccination on ordinary lines. That was before he became medical officer of health for Leicester. In 1902, a year or two after he had gone to that town, he gave an address to a branch of the Society of Medical Officers of Health on "The Rôle of the Anti." It was an interesting deliverance, exhibiting sympathy with people of eccentric views on various subjects, and saying much generally in favour of the "anti-" minded. In doing so he made, as it seems to me, one serious mistake. "First and foremost," he said, "the most striking feature of the 'anti' is his *independence.*" The "anti" cares nothing for authority nor authorities. "So far from his being prejudiced in favour of the views of the majority, his sympathies are usually with the minority, and if the minority is a small one, so much the better." But—and it should have been obvious to Dr. Millard—prejudice against the majority is not independence. Independence connotes impartiality of attitude and of judgment. The "anti," instead, does not weigh opposing views neutrally and according to their merits. He is repelled by considerations which attract the ordinary intellect, is attracted by whatever appeals to the smallest number of minds, is led to defy the laws of evidence, to reject natural conclusions, to evade facts, and to resort to sophistries in substitute for reasoning. No man indeed is more prejudiced than the "anti." But Dr. Millard has always had a strong and laudable love of independence, and his fundamental error that the "anti" is independent has sadly distorted his vision. It is a great pity, for if I may say so without assumption of authority, Dr. Millard is a man of marked ability, energy, and assiduity.

I have read with much interest in THE LANCET of Feb. 9th his criticism of my address to Members of Parliament. His opinion of it differs totally from that expressed in a leading article in THE LANCET of Oct. 13th, 1923, and I might have left the two views to be measured against each other, but that would have been relying on abhorrent "authority," and so, without following Dr. Millard into every detail of his review, I proceed, if the Editor will allow me, to comment on some of its salient features.

1. *Infant Vaccination.*—Dr. Millard charges me with vagueness in the use of the term vaccination, and with, in that way, unintentionally misleading, or tending to mislead, my audience. He says, referring to my remarks on the Poplar outbreak of small-pox last year, "many of his hearers would probably think that by 'vaccination' he meant infant vaccination." Again, with reference to the proposition that small-pox can be prevented by vaccination, he asks, "What exactly does he mean by it, or rather, what would his hearers be likely to think he meant by it?" and "if he meant, or if his hearers thought that he meant (as most of them no doubt would think), that small-pox can be prevented—i.e., effectually controlled—*in the community* by a State system of infant vaccination, then I submit the proposition cannot be substantiated."

This supposition that I was suggesting either by silence or by speech, either intentionally or unintentionally, that primary vaccination is enough, or, in other words, that revaccination is not necessary for protection of the community, fairly astonishes me. He quotes me correctly as saying, "In whatever way the data are questioned, from whatever angle the problem is viewed, the conclusion is the same." But he seems entirely blind to the fact that two or three lines later I go on to say—and here I may be allowed to italicise the crucial words—"if the diminution in small-pox be considered in places and times, side by side with the practice of *vaccination and revaccination*, strong proof of causal relationship appears." In the next paragraph I speak of "countries which are *well vaccinated and revaccinated*," and after that of "classes which are *well vaccinated and revaccinated.*" In some places the page is bespattered with references to the value of and need for revaccination. I point out how at the time of the Royal Commission the medical press held that "vaccination and revaccination were alike necessary for control of small-pox." In one passage, indeed, I speak not merely of revaccination, but of renewed revaccination in presence of small-pox. But independently of the fact that my address was full of revaccination, it is surely out of the question to suggest that Members of Parliament are not aware through their general knowledge that, as expounded times without number not only in THE LANCET and other medical periodicals, but also in the lay press and otherwise, the medical profession regard revaccination as essential for communal protection. In fact, I can call to mind only one member of the profession who has ever in the present generation confined the broad term vaccination to the period of infancy. That member is Dr. Killick Millard. In bringing himself more or less into line with the Leicester anti-vaccinationists who boast about that town's alleged "abandonment of vaccination," he made the remarkable reservation that when he said "vaccination had been abandoned," all he meant was "infantile vaccination as established by law in this country," or again, "universal vaccination." He thus himself deliberately gave to the term the limited meaning which he now, without the slightest justification, charges to my account. And by this device, though with a somewhat falsetto voice, Dr. Millard enabled himself to join in the chorus or duet that "Leicester had abandoned vaccination."

2. *The Story of Kilmarnock.*—I have incurred Dr. Millard's reproof by telling the Members of Parliament the story of small-pox in Kilmarnock in the eighteenth century. To me it seemed quite reasonable, and perhaps interesting, to give from an authentic source an illustration of what small-pox was in respect of prevalence, fatality, and age-incidence in this country in pre-vaccination times, and to go on to tell the audience that "it was in the midst of these conditions that Jenner came with vaccination, and though he made mistakes, it is no exaggeration to say that in such circumstances his conception that cow-pox was small-pox of the cow and would prevent small-pox in man was the direct means of saving more lives and averting more misery than it had ever fallen to the lot of a human being to accomplish from the dawn of history up to Jenner's day." He charges me with an attempt to create prejudice —"(of course this is not intended in an offensive sense)"—and with acting the part of a clever barrister. But surely I may beg my censor to note what he himself calls attention to in the same page. At the beginning of my proposition that "small-pox can be prevented by vaccination," I wrote "the mortality from small-pox is much less since vaccination was introduced. That in itself proves nothing." Dr. Millard says that I "admit" this. Then why does he not give me credit for the admission in mitigation of my "harrowing picture" of old Kilmarnock? It appears in the same address to the same audience, with only a page between. Did he want me to break the reasoned sequence of my address and jump from the middle of the first proposition into the second, lest during the intervening minutes some Member of Parliament might feel unduly stirred? Does he think Members of Parliament are mental defectives?

3. *The Vaccination Acts.*—Dr. Millard complains not only of what I have said, but of what I have not

said. In his opinion, when I was addressing Members of Parliament, "the question, and really the only question which concerns them, is the necessity or otherwise of *compulsory infant vaccination*." Here I differ from him absolutely. Compulsion or non-compulsion is a question not for doctors as doctors, but for the legislature. That is a view urged by me as long as a quarter of a century ago. The duty of the medical profession is to inform Parliament and the public of the truth about vaccination, its value and its safety, and having done so, to leave Parliament to deal with the law. Indeed, having begun my address by telling the audience about both mild small-pox and severe small-pox, I ended it with the following exordium: "If Parliament disbelieves in vaccination it should repeal the Acts. If it believes in vaccination it should exercise some degree of pressure in support of its belief, not by attempts at compulsion which would do far more harm than good, but by drawing some practical distinction between a parent no doubt wrong-headed yet sincere in his conviction that vaccination is evil, and another parent who is merely indifferent or neglectful."

Dr. Millard, however, would presumably take a very different course. He would plunge right away into politics, and would urge that all legislative pressure towards infant vaccination should cease. He would explain that this is not because he doubts its anti-variolous power, but, paradoxically, because he is well aware of it, and wishes that children or adults attacked by the classical type of small-pox should, owing to want of vaccination, have the disease in a form so severe as to make it all the more certainly and quickly diagnosed and isolated. That would be done in the interests of others who, or whose parents, had refused or neglected to take advantage of the protection which Dr. Millard knows vaccination to confer. Severe small-pox, of course, has a high fatality-rate, and leaves much disfigurement and some blindness amongst survivors. That would be part of the price paid vicariously under Dr. Millard's scheme by those who would remain unvaccinated as a result of abolition of all that remains of obligation under the Act of 1907.

He thinks that in this way much more would be gained than lost, otherwise he would not have advanced the proposition which I have stated in what appear to me to be its real terms, though they would not be his. But, however expressed, surely the scheme is utterly and ethically wrong. As medical men we have no right to gamble with human life and health in any such fashion. No doctor should dare to endanger the life of his child patient, John Smith, by refraining from protecting him against small-pox, in the hope that thereby John Brown and John Jones may ultimately, in the manner above indicated, escape small-pox. No doctor refrains from doing his best to cure or prolong the life of a tuberculous patient because he might subsequently infect others. It is our elementary duty to save a life, whether by protective or curative treatment whenever and wherever we have the opportunity, and to leave the final outcome in other hands. At the best we are poor purblind blundering creatures, but our ability remains the measure of our responsibility. I am not, however, going to argue about ethics, but our case is not confined to a question of moral principle. With very rare exceptions the medical profession holds that, to protect from the risk which alarms Dr. Millard, the unvaccinated should resort to vaccination, and the once vaccinated to revaccination, instead of trusting themselves to an extraordinary scheme, whereby those who are at present protected by infant vaccination should be replaced by a fresh community of unvaccinated with the view that, if attacked by small-pox, they should probably have a severe and unmistakable even if occasionally a fatal attack. Is not, let me ask, Dr. Millard's attitude as between the safety of these two sets of children: those whose parents bring them for vaccination under the present law, and those whose parents negligently or obstinately decline so to do—an indication of the "anti" development of mind?

4. *Individual and Communal Protection.*—Referring to my having pointed out that vaccination in this country has never been really but only technically compulsory, Dr. Millard remarks, "surely this is a verbal quibble." It is instead an incontrovertible and pertinent fact, and it was so when I pointed it out so long ago as 1898. Very oddly, the evidence which he adduces that this is a quibble demonstrates just the opposite. He shows how the Leicester Guardians failed even by prosecution and distress warrants to secure vaccination. But that is exactly my contention. Vaccination never has been compulsory. Dr. Millard evidently attaches much importance to a distinction between protection of the individual and protection of the community. Here he is under the influence of a false analogy between the old practice of small-pox inoculation and the modern practice of vaccination. Variola, whether inoculated or caught in the natural way, was infectious; vaccinia is not. But what after all is the difference between individual and communal protection? A community is made up of individuals. If one person is duly vaccinated he is safe until he needs revaccination, and after it he is safe again. If ten are so protected they are safe; if ten thousand, they are safe, and so on to infinity. But there is one advantage in communal as distinguished from individual vaccinal protection. Its value increases by a kind of compound interest. Even if in the protected community there is some small drift towards renewed susceptibility owing to lapse of time, the one is guarded by the many—he has around him a cordon of vaccination. This leads to the question of vaccination in Germany.

5. *Germany.*—Referring, before the war, to the remarkable immunity of Germany from small-pox Dr. Millard repeatedly bore testimony to the value of its system of primary and revaccination. He wrote in 1911[1]: "I quite believe that if the German system (including a third vaccination of all males) could be adopted in this country equal results would be obtained," and in the same connexion he said in 1914 that "a system of universal vaccination and revaccination and re-revaccination, where it can be effectually enforced, will practically abolish small-pox."[2] But in 1917, when news began to arrive about small-pox outbreaks in Germany, his attitude underwent a remarkable change, or at least it was very differently revealed.[3] "Behold," he cried, "Germany, the much vaccinated and revaccinated Germany, which for years past has been held up as a shining example and pattern to the world in the matter of vaccination, is now suffering from several serious outbreaks of small-pox in various parts of the country! Surely it is time that existing theories about vaccination were re-examined." Now, in THE LANCET, he writes in similar fashion. But it was he who so shortly before the war had declared his belief that the German system effectually enforced would "practically abolish small-pox." When I come to the relationship of the mild type of small-pox to the case of Leicester it will appear that this *volte face* about Germany does not stand alone.

But in his outburst over the occurrence of small-pox in Germany all sense of proportion deserts Dr. Millard. When Germany's testing time came in the great war, when hundreds of thousands of prisoners from ill-vaccinated Russia were brought within its borders, Germany experienced in its 60 million population nearly 11,000 cases of small-pox. Let us take 11,000 without any limitation of "nearly." There was thus one case of small-pox in six years to every 5500 of the population. When Leicester's very mild test came in 1902–04, not in war, but in peace, there were 715 notified cases. Writing of the 1903 epidemic he remarked, regarding unrecognised small-pox (*Public Health*, Vol. xvi., p. 618), "I believe there were many

[1] Brit. Med. Jour., 1911, i., 1351.
[2] The Vaccination Question, p. 191.
[3] Brit. Med. Jour., 1917, i., 409.

other cases which never came to light at all," but, confining the comparison to those notified, and taking the Leicester population at 220,000, there was in 20 months one case of small-pox to every 300 of population, as against, in Germany in six years, one case in every 5500 of population. Yet, according to Dr. Millard, the broad results of the Leicester experiment have been "successful beyond all expectation," whilst Germany "has fallen so sadly from grace." And if Dr. Millard holds that account must be taken of the years in which Leicester (like the rest of England) has had little small-pox, let him also take account of the wonderful freedom which Germany has enjoyed since it adopted systematic vaccination and revaccination, notwithstanding the ill-protected condition of neighbouring nations.

6. *Temporary Protection.*—Dr. Millard insists again and again that vaccination gives only temporary immunity from small-pox. The way in which he stresses the word "temporary" is notable. He says that "of course" the altered age-incidence of small-pox is a perfectly sound argument for proving that vaccination confers temporary immunity against small-pox in the individual, but "it may simply shift the incidence of small-pox from one age to another." The Royal Commission concluded that the duration of highest protection might fairly be said to cover a period of nine or ten years, that then its efficacy "against attack rapidly diminishes, but that it is still considerable in the next quinquennium, and possibly never altogether ceases," that its efficacy to modify the disease diminishes more slowly, and during the later period of life it is "still very considerable." With a slight reservation as to duration of the highest protective potency, Dr. Millard has professed his entire acceptance of all this, yet he says infant vaccination "may simply shift the incidence of small-pox from one age to another."

About the Poplar outbreak Sir William Hamer stated, as noted in my address, that the three shortest intervals between primary vaccination and attack were 14, 16, and 16 years respectively; that the three shortest intervals between primary vaccination and a *fatal* attack were 43, 44, and 49 years respectively; and that the ages of the other fatal cases vaccinated in infancy were 58, 66, 66, 67, 69, 72, and 73 respectively. But, after all, to adopt Dr. Millard's view, the man of 73 had only had "'temporary" freedom from the disease. He might otherwise have lived to be 100.

In my address I said that "In towns where small-pox prevails more of the unvaccinated than of the vaccinated are attacked especially if the vaccination is recent." In illustration of that statement I gave the following figures, taken from a table in the Royal Commission report, of attack-rates among the vaccinated

—	Incidence-rate under 10 years of age.		Incidence-rate over 10 years of age.	
	Vaccinated.	Unvaccinated.	Vaccinated.	Unvaccinated.
	Per cent.	Per cent.	Per cent.	Per cent.
Warrington ..	4·4	54·5	29·9	57·6
Dewsbury ..	10·2	50·8	27·7	53·4
Leicester ..	2·5	35·3	22·2	47·6
Gloucester ..	8·8	46·3	32·2	50·0

and unvaccinated in invaded houses. With reference to what is, or was, a frequent allegation of opponents of vaccination, that higher attack-rates and death-rates among the unvaccinated were to be accounted for by their constituting a weakly class whose vaccination had been postponed or omitted owing to the state of their health, I pointed out that this could not be said of centres of anti-vaccination where the operation was, in fact, entirely optional, these places including Leicester, Gloucester, and Dewsbury. On the contrary, if, as has been argued, vaccinated children have their blood poisoned by vaccination, they would more readily succumb to infection than the unvaccinated, whereas the opposite is the case.

But Dr. Millard's sole reply is, "This, I submit again, only proves that vaccination confers temporary immunity on the *individual*," and that "small-pox inoculation would show the same effect." That is positively all that these facts convey to his independent mind.

Perhaps his most singular remark in this connexion is with regard to the immunity of nurses. He says: "I quite accept the immunity of small-pox nurses as definite and convincing evidence that by vaccination (repeated as often as necessary) it is quite possible temporarily to protect *individuals* against small-pox, but I submit emphatically that this is no evidence that infant vaccination will, or does in fact, protect the community." He squanders emphasis here in denying what no human being in his senses ever dreams of asserting. How could the protection of adult nurses prove that infant vaccination would protect the community? If infant vaccination had that power there would be no need for revaccination of nurses, they being part of the community. But vaccination "repeated as often as necessary" gives *permanent* not *temporary* protection. If a man travels far enough east he ultimately reaches the west, and Dr. Millard's anxiety to use the word temporary wherever he can find room for it lands him in the strange position that temporary and permanent are exchangeable terms, meaning exactly the same thing.

7. *Absent Small-pox.*—He says I might have pointed out that "in spite of the steadily increasing neglect of infant vaccination throughout the country, small-pox has become, during the past two decades, one of the rarest of the zymotic diseases, and the mortality caused by it has been negligible." But here he is putting the cart before the horse, and is adopting one of the most obvious sophistries of the present day anti-vaccinationist. When vaccination is practically voluntary, the main stimulus to its performance is the presence of small-pox. In Britain we have been extraordinarily well off in respect of small-pox, both as to low prevalence and low fatality for two decades. On that account there has been very little vaccination. And so, it will always be possible to exhibit, as lately in an extensively circulated table, in two parallel columns, much vaccination and much small-pox, little vaccination and little small-pox. But it is the latter fact that accounts for the former. The table, for example, shows that in 1872, when 85 per cent. of the births were vaccinated, there were fully 19,000 deaths from small-pox, whilst in 1921, when only 38 per cent. of the births were vaccinated, there were only five deaths from small-pox. And it may safely be said that if in 1924 there were 10,000 deaths from small-pox the vaccinations, including revaccinations, would be in millions. In Glasgow the anti-vaccinationist could show from p. 8 of my printed address that there were in 1901–02 over 400,000 recent vaccinations, and yet nearly 1800 cases of small-pox occurred. But when small-pox diminished, vaccination diminished also. In so far as vaccination is carried on when small-pox prevalence is at a low ebb, it is an insurance against future risk, so that the rare accident of a death in any way related to vaccination is not to be measured, as Dr. Millard would wish, against current deaths from small-pox, but against what is to be encountered when variola reappears.

8. *Tetanus and Vaccination.*—Dr. Millard says I might have mentioned to my hearers "a series of disasters which occurred in the State of New York a few years ago, as a result of which it was decided by the State Legislature virtually to repeal the enactment which made universal vaccination compulsory." This question was raised by Dr. Millard in 1922, when he wrote: "I can say, however, that in 1915 the State of New York, acting on the advice of their health officer, Dr. Herman Biggs, virtually abolished compulsory vaccination by repealing the regulation under which all children had to produce evidence of vaccination before being admitted to school. Dr. Herman Biggs, who is one of the most experienced and distinguished members of the Public Health Service in the States, gave this advice, I understand, because he

had come to believe that the disadvantages, in the way of injury to health caused by child vaccination, more than outweighed the advantages to be gained by immunisation against a rare disease like small-pox." It chanced that Prof. Mazyck P. Ravenel, M.D., of the University of Missouri, read this statement, and sent to Dr. Herman Biggs a quotation from Dr. Millard's letter. He received from Dr. Biggs a reply, which began: "The quotation as regards my attitude towards vaccination is, of course, incorrect." He went on to tell how in a great vaccination campaign in the State of New York in 1915 there had been a number of cases of tetanus, with 11 deaths, that in consequence legislation was introduced which would have repealed all the provisions of the vaccination law and would have injured the whole public health programme, that to insist on compulsion under the existing conditions was not justifiable, and that he had therefore consented to amendment of the law. This was a very different attitude from that attributed to him by Dr. Millard—"that he had come to believe that the disadvantages in the way of injury to health caused by child vaccination more than outweighed the advantages to be gained by immunisation against a rare disease like small-pox." Indeed, there is not a syllable by Dr. Biggs which excuses these words. Dr. Millard replied, expressing regret, "if" he had misrepresented Dr. Biggs, but at the same time expressing pleasure in having guarded himself by the reservation "as I understand." He went on to explain that he had been told about the matter by an officer of standing in the New York State Service, and had made a written note at the time of what he was told.

Eleven deaths from tetanus introduced by vaccination would most certainly and most justly be regarded in this country as a great disaster. But no event of the sort has ever been recorded in England. Dr. T. D. Acland, who investigated the whole subject of vaccinal injuries for the Royal Commission, was acquainted with only one case in more than five million consecutive vaccinations in this country, and even in it there was no evidence that the tetanus was invaccinated. In the Registrar-General's office the books, in which are set down all references to vaccination in certificates of death, go back for 29 years—from 1895 inclusive—and while diseases like measles, whooping-cough, bronchitis, erysipelas, &c., are mentioned, tetanus finds no place whatever in the volumes. Besides, I was addressing members not of the American legislature, but of the British House of Commons. Yet Dr. Millard in his anxiety that nothing should be missed which could possibly be alleged against vaccination, would have had me look across the Atlantic in search for such material. Hearsay was quite enough to satisfy him that Dr. Herman Biggs agreed that the disadvantages of vaccination outweighed its advantages. Similarly he chanced to read in a lay newspaper that all of 22 who died of small-pox in the Poplar outbreak had been vaccinated in infancy, and he wrote to the medical press that "it is interesting to learn" this, with the result that when it was pointed out to him by someone that he was wrong, he had again to express his regret, but again with a reservation—this time that the statement so "interesting to learn" was "quite immaterial" to his main argument. The readiness with which he accepts and gives currency to such a story is typically "anti."

9. *Leicester.*—Naturally Leicester bulks largely in Dr. Millard's thoughts, and he may be excused for complaining that I did not say more about it in my address. Well, it would have been quite easy to occupy the whole available time with the case of Leicester, and it would have made quite a good text, but the title of the address was Small-pox and Vaccination, and the discourse had to be of a wider scope. I had no occasion to evade the issue, however, and as Dr. Millard feels aggrieved I shall indicate what might have been said had the subject been Leicester.

(*a*) *Unfulfilled Prophecy.*—Dr. Millard regards few of his compositions on the subject of vaccination and small-pox complete unless they contain reference to one particular passage in "Vaccination Vindicated," published by me 37 years ago. I have noted it in *Public Health* in 1904, in his book "The Vaccination Question" in 1914, in *Public Health* in 1917, and now once more in his article in THE LANCET. I do not recollect paying attention to it until the Milroy lectures in 1919, but then I took the trouble to call his attention definitely to the mangling to which he had subjected the passage in question. I wrote as follows in 1887: "In Leicester when its time arrives we shall not fail to see a repetition of last century experiences, and certainly there will afterwards be fewer children left to die of diarrhœa. It is to be hoped that when the catastrophe does come the Government will see that its teachings are duly studied and recorded." And also: "Throughout the country there has been nothing approaching an epidemic since 1870–73, and Leicester has had little chance of getting its 'immunity' tested. When another great outbreak occurs among the susceptible population of England it will be time enough then to see how Leicester comports itself under the ordeal." In Stevenson and Murphy's "Hygiene" in 1893 I repeated the reservation that "since the Leicester experiment was begun it has not been subject to the test of any general epidemic like that of 1870–73." That obviously was in my view the criterion of Leicester's protection—the occurrence throughout the country of an epidemic approaching that of 1870–73. The matter is of little moment, but as Dr. Millard evidently regarded it as of great polemic value I specifically pointed out to him in the Milroy lectures that he "does not give the full quotation, and in 'The Vaccination Question' he definitely excises my reference to the 1870–73 epidemic."

Now, in THE LANCET in 1924 he makes the same excision, which perhaps may be taken as an incidental indication of his attitude to the whole subject. The question is not what he thinks of the point I raise, but what I think, and he has no right whatever to exclude from the quotation the words I have asked him to include.*

Apart from the personal question, two important considerations have to be borne in mind, first, that glycerinated calf lymph is now available to meet the needs of any epidemic anywhere, as compared with the meagre quantities of humanised lymph which alone were readily obtainable from the weekly vaccinations of babies at the time I wrote; secondly, the substitution throughout the provinces of the mild American type of small-pox for the virulent Eastern type—a substitution which no one foresaw in the days when the pandemic of the seventies ruled the conceptions of the profession and the public as to what small-pox meant in epidemicity, infectivity, and mortality. And so little am I troubled by the fact of having been no more able than anyone else to visualise the coming change, that, after all, here and now I give Dr. Millard full permission—though he no more needs it than a man needs the gift of the freedom of his own city—to go on mangling that quotation throughout the rest of his life.

Curiously, in 1917 and 1919 Dr. Millard himself has had some hankerings after prophecy. Referring to what appeared in the Milroy lectures about the possibility of the disappearance of small-pox, and, consequently, of the need for vaccination, he said: "I go a little further, and say that as small-pox has *already* virtually disappeared so also has the need for infant vaccination. In this matter I am merely a few years ahead of Dr. McVail, that is all." But he was at least a few years too far ahead of me. Since 1917, when there were only seven cases, the subsequent years have successively had 63, 311, 280, 336, 973, and about 2500 cases, whilst in the first eight weeks of 1924 there have been 563 cases. If

* Too late for notice in the text I find that in "The Medical Officer" of March 15th Mr. Millard once more makes the quotation and once more excises the words in question.

this goes on someone may by and by accuse him of unfulfilled prophecy, but if so I hope he will be quoted correctly.

(*b*) *The Method.*—Had I gone briefly into the discussion of Leicester and its method I would have had to state that the story of Leicester being well vaccinated before the pandemic of 1870–73 was apocryphal (Dr. Millard being partly responsible for the Apocrypha); that the Leicester method was largely a paper method which sufficed for anti-vaccination propaganda when small-pox was absent, but broke down in point after point when small-pox was present; that, indeed, what was abandoned when small-pox came was not vaccination, but the method itself in its most advertised features; that vaccination was at once resorted to, that hundreds of contacts were vaccinated, and that in order to make more room for small-pox the hospitals were emptied of scarlet fever, which had to be allowed to run its course in the houses of the patients.

It would have been a pleasure to add (and I wrote to that effect in 1913) that by heroic measures like these, which were thoroughly justified in the dangerous condition of the population in respect of liability to small-pox, Dr. Joseph Priestley succeeded in limiting the epidemic of 1892–93 to 355 notified cases in 15 months, and that Dr. Killick Millard by similar unwearying devotion to duty was able to limit the disease in about 20 months in 1902–04 to 715 notified cases. One factor which contributed greatly to the limitation of cases alike in 1892–93 and 1902–04 was the general mildness of the type of disease, and its consequent low infectivity, notwithstanding the greater likelihood of cases being missed. But unfortunately the credit thoroughly well earned by Dr. Millard for his limitation of the prevalence of the disease is somewhat tarnished by a subsequent want of candour. In 1904 he freely acknowledged how much he owed to the attenuated strain of the virus. "I fully realise," he said, "that the results of the experiment in the future may be very different from those achieved in the past. Moreover, it may have been merely a lucky coincidence that the two epidemics which have occurred since vaccination has been abandoned have been of such an exceptionally mild type. The epidemic at Gloucester was far more fatal."

He was here very prudently and properly reserving his opinion as to what might happen to the town if it were invaded by the old 1870–73 type of epidemic variola. Fortunately no such calamity has befallen the Midlands of England, and Leicester has shared in the unparalleled freedom from severe small-pox. But in 1914, ten years later, he concluded he could safely destroy the bridge he had built for possible retreat. And in doing so he rather comically wrote as if it was not he who had constructed it for himself, and he proceeded to jeer at those to whom he would like to attribute it. "Many people," he writes, "appear to think that, owing to some extraordinary good luck, small-pox has never come to Leicester in a fatal or epidemic form since vaccination was abandoned." Again, "Hitherto it had often been alleged that the 'Leicester method' had never been adequately tested, and that Leicester had been lucky." Thus, under the curious pseudonym of "Many people" he attacks himself for having been so needlessly wise in 1904, and he deserts the sound view of the debt Leicester owed to the mildness of type of its small-pox for the thesis that "it seems more reasonable to ascribe the low case-mortality to the comparatively good sanitary state of the town." I shall now show how Dr. Millard supports that hypothesis.

(*c*) *Mild Small-pox.* — Dr. Millard [1] gives the following table.

Small-pox Epidemics in Leicester.

Year.	Population.	No. of cases.	No. of deaths.	Attack-rate.	Mortality.	Case-mortality
1871–72	100,000	(3300)*	358	(33·0)*	3·58	(10·8)*
1892–93	183,000	355	21	1·94	·11	6·0
1902–03	220,000	394	21	1·79	·09	5·3
1903–04	224,000	321	4	1·43	·02	1·3

* Estimated only.

Concerning the lessened severity shown in the table, he remarks that, "Obviously, some factor other than vaccination has been at work, and it is reasonable to suggest that improved sanitation is the most probable cause." The figures for 1871–72 are only an estimate, but the pandemic of which they were a small item was of extraordinary extent and this country has never again had such a visitation. Let it be noted, however, that the greatest proportionate diminution was between the third and fourth epidemics, the latter having barely one-quarter of the fatality-rate of the former. The third epidemic was that of 1902–03, the fourth that of 1903–04. But the first known case of the 1903–04 outbreak began less than six weeks after the onset of the last of the cases of 1902–03: in fact, the hospital had to be reopened within less than one week of its closure. Yet Dr. Millard thinks it "reasonable to suggest" that the reduction of fatality from 5·3 to 1·5 per cent. was most probably due to sanitation. Sanitation having taken 20 years to reduce the rate from 6 to 5·3, suddenly, in a period of weeks or months, reduced it to 1·3. And Dr. Millard does not seem to be joking in submitting his table. The fact is, as already urged, and as realised by Dr. Millard at the time, Leicester was sharing in the attenuated strain of small-pox which prevailed in the provinces of England in 1902–05. Though the Leicester fatality rate in the epidemic prevalence of that time was very low it was by no means the lowest. Everywhere else, so far as I know, the very favourable case mortality was thankfully accepted as due to the mild strain of small-pox. But that view is no longer good enough for Leicester, and so Dr. Millard submits the alternative on which I have commented.

The cause or causes of the remarkably diminished prevalence and fatality of small-pox since the beginning of the present century is a subject of the greatest epidemiological interest, but it cannot be entered on here. Epidemic diseases change from age to age and from generation to generation. Up till 1917 small-pox was retreating whilst influenza has advanced. The out-and-out opponent of vaccination would attribute the decline of small-pox to sanitation without attempting to analyse that term, whilst he is beginning to revive the old fable that increase of cancer is due to vaccination.

Concerning the future, I may recall that more than 30 years ago, probably before Dr. Millard had begun controversy in support of vaccination, I wrote (in Stevenson and Murphy's "Hygiene") that "it will not do to assume that throughout the world, from now to the end of time, small-pox will continue to rage epidemically unless prevented by universal vaccination," that "quite conceivably, small-pox rather than either scarlatina or measles, might be the next in order of the maladies to disappear from the civilised world," and that "when small-pox does go, the world will be rid of it, but while the bane remains with us, so also must remain the antidote." That is still my opinion. If we could be sure we were done with small-pox, then, indeed, vaccination should be abandoned not in the sophistical Leicester sense, but in reality, and the vaccination epoch would only remain in medical history as the time of the greatest success which had ever been achieved in the development of preventive medicine. Six or seven years ago it almost looked as if we might be approaching the disappearance of small-pox, but, unfortunately, there has now been a serious relapse into renewed prevalence and we dare not yet dispense with the proved preventive.

Finally, my apologies are due to THE LANCET and its readers for occupying so much of its space in the first year of its second centennium.

[1] The Vaccination Question, p. 125.

THE EFFECTS OF RADIUM AND X RAYS UPON NORMAL AND CANCEROUS TISSUES.

THE admirable memorandum on cancer issued for the guidance of local authorities from the Ministry of Health in August last,[1] is to be supplemented, as occasion permits, by additional memoranda. The effects of radium and X rays upon normal and cancerous tissues is the subject dealt with in the first[2] of these supplemental monographs by Prof. W. S. Lazarus-Barlow.

Early Investigations and Conclusions.

In discussing early investigations and conclusions, he points out that from the empirical employment of X rays and radium, shortly after their discovery, in the treatment of cancer, the following facts emerged. It became clear that all varieties of cancer were not equally amenable to irradiation; also that X rays were not an entity, but that the rays were of different wave-lengths. Similarities between the rays from radium and X rays were noted immediately; differences were detected at a later date. At the present time each agent of radiation has its own more or less well-defined region of applicability, while sometimes a combination of the two is more effective than either used singly. It became clear that the action of radiations upon a group of cancer cells regarded as a new growth was not identical with that upon cancer regarded as a disease. Even though the duration of the disease were unmodified by treatment with X rays or radium, there was ample evidence that by their use the lot of the patient was often rendered more endurable. It became clear that whatever the degree of amenability of a growth to irradiation in the first instance, it became less responsive to irradiation on subsequent occasions. Lastly, it became clear that research was necessary upon the response of animal cells of all kinds to the varieties of radiation represented by soft, medium, and hard X rays, and alpha, beta, and gamma radiations from radium. More or less synchronously some attention was given to the biological properties of ultra-violet light, which consists of rays whose wave-length is greater than that of the softest X rays, and to the radiations from mesothorium, which compare with the rays of radium.

The casual nature of much of the pioneer work on the therapeutic use of radiations, together with the absence of fundamental data or precautions, much impaired its value. Later observations of the biological action of radiations are more systematic. Prof. Lazarus-Barlow divides these into investigations into their effects upon (1) normal cells and tissues; (2) cells of new growths, whether malignant (cancer) or non-malignant; and (3) cancer as a disease, where the radiations act on cancer cells intermingled with non-cancerous cells in an individual abnormal because the subject of disease. Owing to the lacunæ in our knowledge, it is impossible to consider X rays and radium rays separately, but there is reason to believe that much that is true for gamma rays of radium is also true for hard X rays, and that to some degree the same obtains for beta rays and soft X rays.

The Effects of Radiations upon Normal Cells and Tissues.

The nucleus, or cytoplasm, or both, may become dropsical or show isolated clear spaces (vacuoles) after exposure to irradiation; the rod-like chromosomes become irregular in shape, or granular, and divide irregularly; the framework of the nucleus, instead of showing an even arrangement, becomes collected into irregular heaps; the material formed by secreting cells is altered in quality or quantity; and the cytoplasm may undergo degenerative changes, chiefly mucoid. These are early changes. A day or two later, if the irradiation has been severe, dying and dead cells and fragments of nuclei or cells are seen, or a structureless mass of material may be the sole representative of the former living cells. If the irradiation has not been too severe, signs of recovery become manifest, and there is evidence that the damaged cells are being removed.

Changes such as those described, when occurring over a large area, lead to profound disintegration of tissue. This action must be remembered when deeply-seated abdominal new growths are treated by large doses of highly penetrating (hard) X rays. Before the great radio-sensibility of the intestine was recognised, cases occurred in which the medical practitioner, in his endeavour to irradiate sufficiently a cancer of the womb, damaged the intestine to such an extent as to be dangerous, and in a few cases fatal, to the patient. At the present time this danger is well recognised and guarded against.

It has been shown that cells and tissues manifest great differences in the degree to which they are affected by rays. The radio-sensibility of the lymphocyte of the blood and lymphatic glands is so great that an intense destruction occurs within an hour after a slight exposure of the animal to gamma rays; cells of the pancreas and thyroid, on the other hand, appear to be unchanged, even after severe irradiation; and brain cells are unaltered except under large doses. The behaviour of the same variety of cell differs in different animals. In the domestic cat, where fatty conditions are common in the kidney, gamma radiation leads to a profound fatty degeneration in the secreting cells of that organ, which has no parallel in any other species of animal hitherto examined. In the rat and in man voluntary muscle shows a marked proneness to degenerative changes of a fatty nature that does not occur in the frog, the rabbit, or the cat.

Differences of a like kind obtain even with cells commonly regarded as belonging to a single class. Endothelial cells lining blood-vessels show a few changes, while those lining certain of the large spaces of the body, or covering the stomach and intestines, show intense desquamation, and this in the same animal exposed to a single dose of gamma radiation.

Besides these injurious or destructive effects of radiations upon cells, in certain instances it has been found possible, by using minute doses of rays, to stimulate cells to increased rapidity of division. There is some evidence also that a muscle and nerve, under slight radiation, are stimulated, so that the muscle is rendered capable of putting out more work. The point is one of great importance in the radio-therapy of cancer.

Effects of Radiations upon Cells of Malignant and Non-Malignant New Growths.

Just as the lymphocyte has been found to be intensely radio-sensitive, so new growths built up of masses of lymphocytes, whether non-malignant (lymphoma) or malignant (lymphosarcoma), respond to irradiation by enormous destruction of the constituent cells. In the same way, the three varieties of carcinomata show alterations under radium or X rays analogous to those undergone by their normal prototypes. In the case of the sarcomata, the cells, like their prototypes, show general rather than particular changes after irradiation. It is undoubted that death of the cells and an intense mucoid degeneration take place, often over large areas.

It would appear that the effects of irradiating sarcoma cells depend rather upon the youth of the cells themselves, and the rapidity with which they attain full size and undergo division, than upon any peculiar radio-sensibility of that variety of cell as such. It is in accord with this view that wide differences obtain between the amenability to radio-therapy of the numerous different varieties of sarcoma.

As to endotheliomata, it has been noted above that the reaction of endothelium to gamma radiations appears to differ in different parts of the system. From observations made on the differences between the

[1] THE LANCET, 1923, ii., 479.
[2] Circular 476. H.M. Stationery Office. 1*d*.

reaction of the lymphocyte and of the endothelial cell under identical radiation it would appear, not only that a radiation treatment which would be effective for a new growth built up of lymphocytes would almost certainly be ineffective for one built up of endothelial cells, but also that in the case of endothelial growths themselves amenability to radiation treatment would vary within wide limits. This is found to be true, some endotheliomata responding well to radiotherapy, others hardly at all.

Under irradiation the fibromyoma often shows remarkable diminution in size, but it is not yet certain whether the rays directly influence the tumour cells, or whether the effect is indirect and dependent upon ovarian changes resulting from participation of the ovary in the irradiation to which the tumour was subjected.

Effects of Radiations in Cancer as a Disease.

The necessity for effective treatment, not only of the central growth, but of the peripheral cancer cells, implies that in order to irradiate a small number of malignant cells great numbers of normal healthy cells of the part are coincidently irradiated, and to that extent damaged. The desideratum for all radiation treatment is maximal damage for the malignant cells and minimal damage for the body cells amongst which those malignant cells lie. It is usual to consider the normal tissue cells as being less radio-sensitive than the malignant cell but the margin is not great, and so much damage to normal tissues may accompany vigorous radiation of a new growth that an extensive intractable ulcer results. By some authors it is held that the poor results of radiotherapy when cancer has invaded bone depends essentially upon the coincident death of bone which the irradiation has brought about.

In yet another direction normal cells are involved when a case of cancer is undergoing treatment by radiations, particularly if the irradiated area be large. The blood circulating through the part is itself under irradiation, and lymphocytic blood changes, owing to the repeated access of fresh blood to the part, in course of time involve the entire circulating blood. In addition, the lymphatic glands may come under the influence of the rays, with the result that the total number of lymphocytes in the body suffers a diminution. Where the patient's blood was normal before irradiation the reduction of lymphocytic numbers may be relatively small, and return to normal takes place after an interval. But where the cancerous disease has already led to blood changes, irradiation, if sufficiently heavy for satisfactory treatment of the new growth, would lead to a grave augmentation of the blood condition and proportionate harm to the patient.

Many authors have described a "flaring-up" of cancer—particularly in distant parts of the body—after irradiation treatment, and have ascribed the phenomenon to operation of a stimulative action by minute doses of rays. Indeed, some authors have gone so far as to suggest that cancer may be originated in non-cancerous tissues in this way. As a matter of practical experience, it would appear that the risk of inducing cancer in a non-cancerous individual during treatment is negligible.

Prof. Lazarus-Barlow proceeds to discuss the various methods of applying radium and X rays in conjunction with each other and with surgery, and concludes as follows:—

"One thing is certain: the mental attitude of those most interested in radiotherapy has changed. Not only do they recognise that the radiations themselves, the cancerous conditions upon which they cause those rays to act, and the influence of the rays upon the normal tissues of the patient are far more complicated than was suspected at first, but also they envisage the radiation treatment in a fundamentally different way. At first the rays were regarded in the light of a specialised variety of caustic. As such they were inferior to many caustics in the surgeon's armamentarium. Then it was seen that cells vary in radio-sensibility, and a directly selective destruction of cancer cells was the goal, but was barely attainable by reason of the insufficient delicacy of our methods. Last of all, there has arrived in the minds of some authorities the conception of radiations as an agent whereby the cancer cells are altered in such a way that they evoke, within the patient's body and through the agency of his normal tissues, an increased production of some substance or substances antagonistic to themselves. The formation of such antagonistic substances within the patient, upon this view, characterises every case of cancer, and the course of the disease varies according to the degree in which they are present. In all but the rarest instances, however, they are insufficient, so that the cancerous process sooner or later gains and maintains the upper hand and leads to death. If by means of subjecting cancer cells to radiations one is able to imitate and enhance this natural process, the hope lies near that a production of antagonistic substances would be induced sufficient to hold the cancerous growth in check, then gain the upper hand, and ultimately destroy the cancer cells themselves."

PARIS.

(FROM OUR OWN CORRESPONDENT.)

The Inauguration of the Anti-Cancer Centre at Montpellier.

THE Minister of Hygiene and Public Welfare presided at the recent inauguration of the anti-cancer centre of Montpellier. Three similar provincial centres already exist at Bordeaux, Strasbourg, and Lyons, which are undertaking the specialised study and treatment of cancerous conditions. The Montpellier centre serves the district of the Languedoc and Roussillon, and is under the direction of Prof. Forgue, assisted by a carefully chosen staff, which includes Prof. Pech, Prof. agrégé Lamarque, for the physical causes of the disease, with Prof. Grynfeltt and Prof. agrégé Turchini for the study of pathological anatomy. Research work will be conducted in conjunction with the heads of the schools of medicine of Montpellier, and since the hospitals of the town have a large clientèle of patients suffering from cancer, it is to be expected that this centre will become one of the most active schools for the study and the treatment of malignant disease.

Shell-fish Control.

Since the introduction of preventive inoculation the clinical aspect of typhoid fever has changed considerably. In a paper read recently before the French Academy of Medicine, Mr. Courtois-Suffit gave a detailed study of 328 cases of typhoid and paratyphoid fever which had come under his observation during the last four years, and in which he expressed the opinion that the disease as it appeared at present was rarely due to water, but was to be traced chiefly to the consumption of infected food, mainly shell-fish, and in particular oysters. The Government has added what amounts to a corollary to this communication, by publishing a circular addressed to local authorities, with the object of controlling the trade in oysters and other shell-fish. Establishments trading in oysters will be listed in future, and only those which have been proved to be conducted on hygienic principles will be permitted to sell their wares. Shell-fish may not be sent from distributing centres unless they are accompanied by an official statement as to the cleanliness of their source of origin, while consignments of shell-fish which are not disposed of in a short space of time will be summarily seized and destroyed.

"Le Salon des Médecins."

The Salon des Médecins was recently opened for the first time since the war, under the presidency of Mr. Paul Strauss, Minister of Hygiene. In this salon are exhibited works of art created by contemporary medical men. The number and variety of these works

of art are great, and include paintings, engravings, sculpture, pottery, and specimens of book-binding. The standard of art is high, and the salon is the more interesting because among the artists whose works are shown may be found the names of doctors who are known to lead busy professional lives, and who find, nevertheless, time to devote their leisure to the creation of beautiful things.

HOLLAND.

(FROM OUR OWN CORRESPONDENT.)

A New Disease Prevention Act.

A NEW law on infectious disease is about to be introduced; the laws now in force on this subject dating from 1872 and 1884. The preamble to the Draft Bill speaks of the old laws as "a queer, confused system of legislation." The municipalities were in charge of the execution of these laws and thus they ordered or refrained from ordering disinfection according to their own views or those of the advisory doctors (who in many cases were not too well-posted on the matter). The Government had no power to force them to act or to prevent them from doing so, if this was considered to be necessary. There was no unity of action and the epidemiological basis left much to be desired. According to the new law, management and control will be entrusted to the district medical officers of health (inspectors). The mayors must simply execute orders, but they can appeal to the head inspector. The theories of Charles Chapin (modes and sources of infection) are only slowly coming home to the Dutch medical men and epidemiologists. Not so long ago, in the case of diphtheria and scarlet fever, the room, bedclothes, the house itself, schoolrooms, &c., were disinfected, whereas in malignant cases expropriation and even destruction was under consideration—and here and there put into practice. A check will now be put on all these economic and epidemiological follies, which the Treasury can no longer afford. The strongest opposition comes from the side of the few sanitary engineers who are directors of sanitary and disinfection services, which services are more and more being brought under the public health service. People are more and more acknowledging the truth of Chapin's words, "Any scheme of preventive medicine which fails to take the carriers and the mild or missed cases into consideration is doomed to failure." Therefore, the Draft Bill opens the possibility of isolating carriers who are considered to be "a *special* danger for carrying the infection" and keeping them isolated until the infectious period is over. In few countries only has it been possible to make rules which encroach so severely upon social life and personal liberty. The Dutch Draft Bill goes even further and opens the possibility of prohibiting chronic typhoid bacilli carriers to work in trades which are specially liable to make possible the carrying of the infection—for example, handling foodstuffs, dairy business, waterworks. These people will be compensated in respect of loss of income if they are poor.

Vaccination.

So far the number of children who have not been inoculated has been small since they are not admitted to school unvaccinated, and education being compulsory only well-to-do people can afford to be objectors. Amongst its 3300 medical men Holland only counts two who give a certificate to every child to the effect that there are "objections on account of reasons of health." Conscientious objectors travel long distances to these anti-vaccination doctors. Political considerations have now induced the Government to insert in the Draft Bill a conscientious objection clause which enables objectors to get exemption after much less trouble, whereas further the signature of one doctor will be sufficient in order to get exemption on account of reasons of health. For the time being the Government want to give no more than 1 per cent. certificates of exemption, but it is likely that, when once an opening is made, the gap will become larger and larger. The medical world is very strongly opposed to this violation of the principle of compulsory vaccination, and it is still quite uncertain whether Parliament will pass the Government proposal.

Compulsory Notification.

The compulsory notification of the cases of infectious diseases mentioned in the decrees of the law is maintained, and this notification is extended to *suspected* cases. In this connexion it should be understood that tuberculosis and venereal diseases do not come under this law on account of the special social and moral aspects of the said diseases. Medical circles are almost unanimously opposed to compulsory notification in the case of tuberculosis and venereal diseases; as regards tuberculosis because no result is expected therefrom, and as regards venereal diseases because the confidence in the doctor would be shaken and many people would be kept back from putting themselves under treatment. Compulsory notification without compulsory effective treatment is regarded as useless.

Dangerous Infectious Diseases.

The Draft Bill discriminates between the dangerous exotic infectious diseases as cholera, plague, typhus fever, and small-pox, and the indigenous diseases as typhoid fever, scarlet fever, and diphtheria. Measles and whooping-cough will not come under the law, but malaria does come under it. For the dangerous exotic diseases compulsory hospital treatment is stipulated unless the family doctor is of opinion that the patient cannot be transported. In the latter cases the most rigorous isolation at home is ordered, a policeman or a soldier is to be placed before the door, who is not allowed to admit anybody but the doctor, the clergyman, and the notary. Such compulsory measures are also possible in case of the other diseases, but they will only be applied in special cases and if the family refuse to take the measures ordered for the prevention of carrying the infection.

KING EDWARD'S HOSPITAL FUND FOR LONDON.

THE annual meeting of this Fund was held at St. James's Palace on April 1st, when, in the unavoidable absence of the Prince of Wales, the Earl of Donoughmore presided.

The Accounts for 1923.

Lord Revelstoke (the hon. treasurer), in moving the adoption of the accounts for the year which ended on Dec. 31st last, said that the conspicuous success of the Combined Appeal, which was opened in April, 1922, resulted in a total distribution of just over £418,000. The special distribution to hospitals through the King's Fund amounted to £365,000, of which £115,000 was distributed in 1923. The income of the King's Fund itself had benefited by the receipt of a considerable sum in dividends on the bequests of Lord MountStephen and Sir Thomas Sutherland. There was also an increase in annual subscriptions. The invested funds were increased by a further £175,000 received from the estate of the late Sir Thomas Sutherland, £11,000 from the estate of Mr. H. H. Wills, and £2000 in smaller sums. Other legacies amounted to £48,000, an amount rather smaller than that received in 1922, but £235,000 was distributed, an increase of £15,000 over 1922, the whole of this sum being provided out of the receipts for the year.

The motion having been seconded by Lord Mildmay of Flete, it was carried unanimously.

Improved Financial Position.

Lord Stuart of Wortley, chairman of the Management Committee, moved the adoption of the annual

report of the General Council. This stated that in respect of income and expenditure, omitting the special distributions, the financial position of the hospitals had shown a steady improvement: the net aggregate annual deficit for 113 hospitals in London having been reduced from £383,000 for the year 1920 to £210,000 for the year 1921 and £174,000 for the year 1922. The total receipts for the year were £575,396 12*s*. 9*d*., of which £145,113 1*s*. was received from the Hospitals of London Combined Appeal; £175,000 from the estate of the late Sir Thomas Sutherland; £2000 from the estate of the late Mr. Samuel Lewis; £48,398 17*s*. 5*d*. from other legacies; £12,767 15*s*. 8*d*. from gifts to capital; and £192,116 18*s*. 8*d*. from general receipts. The amount of the ordinary distribution was £235,000, an increase of £15,000 over 1922. The League of Mercy contributed £14,500, as against £15,000 in 1922. The total received by the Fund from the League since its foundation in 1899 was now £353,500, apart from the sums awarded by the League to institutions outside the area of the Fund's distribution. During the year the amount spent on the administration of the Fund was £8904 17*s*. 6*d*., or £2 1*s*. 4*d*. per £100 of the total received (apart from the Combined Appeal), as compared with £8607 12*s*. 10*d*., or 15*s*. 8*d*. per £100, in the previous year. The average yearly outlay in this respect for the whole period since the inauguration of the Fund had been £3635 2*s*., the corresponding percentage of the receipts being £1 5*s*. 9*d*., or just over 3*d*. in every £1 received.

Hospital Progress.

The adoption of the report was seconded by Sir Frederick Fry and carried unanimously. Sir William Collins then presented the unanimous report of the Ambulance Cases Disposal Committee, copies of which will be sent to the Voluntary Hospitals Commission, to the Minister of Health, to the police and ambulance authorities, and to the voluntary hospitals and infirmaries concerned. The reference of the Committee was limited to the method of ascertaining where bed accommodation was available for accident cases requiring admission as in-patients, and the suggestion that daily reports of vacant beds should be supplied to the police and ambulance authorities.

A message from the King congratulated the Council on the steady increase in the resources and annual grants of the Fund, and a letter from the Prince of Wales contained references to the progress of the hospitals. He stated that the gap between income and expenditure, taking all the London hospitals as a whole, was still closing year by year. For the year 1920, the very worst year of all, the gap, omitting all special distributions, was £383,000; for 1922 it was £174,000; while for 1923 it was too early to give the exact figures; but it was already clear that the hospitals, taken as a whole, had done better still. With the aid of exceptionally large legacies at two or three big hospitals, there was actually a net aggregate surplus, but, even without these legacies, the gap, for the year 1923, would be very nearly closed. This steady progress, going on now for three years without a break, was very hopeful, but it did not mean that the hospitals and the public could go to sleep in the belief that everything would come right of itself. The hospitals will still have to keep up their income at a figure nearly two and a half times what it was before the war, and they also had to be constantly adopting the latest improvements, and extending their work, in order to keep pace with the needs of the patients and the developments of medical science, necessary changes but often very expensive. The figures were only aggregate ones, and while steady general improvement was shown, there were a good many individual hospitals that still had deficits, and at some of these the financial position continued to give rise to serious anxiety.

The proceedings closed with a vote of thanks to the chairman.

Medicine and the Law.

The Harnett Case Appeal.

ON April 7th an application for judgment or a new trial on the part of Dr. C. H. Bond and Dr. G. H. Adam came before Lord Justices Bankes, Warrington, and Scrutton, sitting as a Court of Appeal. The Attorney-General, in opening the appeal on behalf of Dr. Bond, said that the real importance of the verdict in the action, tried before Mr. Justice Lush and a special jury, was this. It would be impossible henceforth to get a medical man to send anybody whom he believed to be a lunatic to an asylum, if the law was that, if a doctor acted negligently, he would be held responsible for all damages that flowed therefrom. Nobody being willing to take the risk of certifying, the country might be flooded with persons who ought to be in asylums. It was, he submitted, very difficult to see how the alleged negligent act of Dr. Bond could make him responsible for the negligence of others. The hearing is being continued. In this appeal, the solicitor to the Ministry of Health is acting for Dr. Bond, Messrs. Le Brasseur and Oakley for Dr. Adam, and Mr. W. E. Hempson for the British Medical Association.

The Public Authorities Protection Act.

In the King's Bench Division Mr. Justice Bailhache dismissed an action for libel brought by Miss A. B. Hope, formerly employed as "house mother" at Shirley Schools against Dr. J. B. Ridley, medical officer of the Bermondsey Guardians. In 1919, in his official capacity, Dr. Ridley made reports to the guardians to the effect that Miss Hope suffered from tuberculosis and therefore was not fitted for employment in the case of children. Miss Hope contended that these statements were untrue and libellous, and that she did not suffer from tuberculosis. Her writ, however, was not issued until a date considerably after her dismissal. The Public Authorities Protection Act, 1893, it was submitted by the defence, covered the case, as under it no action would lie against a public authority for any act done in the execution of a public duty, unless it were commenced within six months of the commission of the act complained of, and further that the Act protected in the same manner any person acting for a public body. It was submitted for the plaintiff that she had only recently been able to prove that she did not suffer from tuberculosis, and that it was then that the cause of action arose. Mr. Justice Bailhache held that Dr. Ridley was protected by the Public Authorities Protection Act and that proceedings had not been taken within six months as required.

Cancer of the Scrotum in a Mule-spinner: a Test Case.

At Ashton-under-Lyne County Court on April 4th, before Judge Mossop, a case was reopened of the utmost importance to the cotton trade in Lancashire. The point at issue is whether "epitheliomatous ulceration" or "epithelioma of the scrotum," contracted in the course of the worker's employment as a mule-spinner, is a disease for which compensation should be paid. The case came before the Stalybridge Court on Jan. 11th last and was then adjourned to enable certain particulars on the certificate to be amended.[1] Mr. E. Wingate-Saul, K.C. (for the applicant), in reopening the case, said the disease got its popular name from the fact that at one time it was prevalent among chimney sweeps. In 1920 it was discovered that it was a disease which was attacking large numbers of mule-spinners, of which there are 20,000 in the country. As a result of Home Office inquiries, in 1920, epitheliomatous cancer was added to the Act. On investigation it was found that out of a very large

[1] THE LANCET, Feb. 2nd, p. 252.

number of cases of epithelioma of the scrotum admitted and treated in the Manchester Royal Infirmary over 50 per cent. occurred in mule-spinners. The disease began on the anterior aspect of the left side of the scrotum. It was stated that when working a spinner "pieced" with his left hand and stood on his left foot, his left side at the groin coming in contact with the faller bar which was coated with mineral oil and the worker's pants became impregnated with the oil. Mr. H. H. Southam, F.R.C.S., who had made investigations on the disease in a cotton mill, stated that the scrotum came against part of the machinery which was covered with oil. Eighty per cent. of the cases in mule-spinners occurred on the left side and only 6 per cent. on the right side, by reason of the fact that the left side of the body came in contact with the faller bar. Under the conditions in which these men worked the scrotum was in a state of constant irritation from the mineral oil. The case under consideration, in his opinion, was absolutely due to the occupation. On an average there were seven cases of epithelioma of the scrotum per annum in the Manchester Royal Infirmary, and about half were mule-spinners. The hearing was then adjourned till May 22nd or June 20th, the date to be arranged later. From the annual report of the Operative Spinners' Amalgamation it is evident that the executive of the Amalgamation is giving careful attention to the subject. Numerous cases have been brought to light as a result of publicity. During the past year a joint committee representing the Amalgamation, the Federation of Master Cotton Spinners' Association, the Cotton Spinners' and Manufacturers' Association, and the Factory Department of the Home Office, drafted and issued a circular to operatives conveying certain simple measures of precaution.

Thompson v. *New South Wales Branch, B.M.A.*

The Judicial Committee of the Privy Council recently dismissed the appeal of Dr. G. S. Thompson, of Sydney, New South Wales, against a decision of the Supreme Court of New South Wales. The Supreme Court had set aside a verdict for £2000 damages obtained by Dr. Thompson against the New South Wales Branch of the British Medical Association which had expelled him from membership, as having been "guilty of conduct derogatory to the honour and integrity of the medical profession" of the State and calculated to bring the profession into contempt and to injure the welfare and interests of the branch of the Association. The conduct complained of by the Association arose out of a case of recurrent insanity in a woman who, Dr. Thompson alleged, had been improperly confined in an asylum and improperly treated by medical colleagues. He had, in the view of the Supreme Court of New South Wales, cast serious imputations upon the conduct of members of the medical profession in regard to their treatment of the patient, founded upon his statements, which, if proved, would have warranted their own expulsion from the Association. In bringing his action Dr. Thompson based his claims for damages largely upon allegations of injury to himself through the rules of the Association forbidding its members to extend professional recognition to an expelled member, which, it was argued, operated in restraint of trade and were void. Lord Atkinson, who delivered the judgment of the Judicial Committee, pointed out that if the aims of the Association were to be carried out as to maintaining a high standard of professional conduct, there must be power to expel a member whose conduct offended against the honour and interest of his profession. If a body such as that which expelled him made a decision which it had jurisdiction to make, founded upon adequate evidence, that decision, in the absence of fundamental error, could only be impeached on the ground of corruption or bias or malice affecting the decision. In his judgment he had referred to the fact that Dr. Thompson had submitted himself to the rules of the Association in joining it originally.

Public Health Services.

INSURANCE MEDICAL SERVICE.

The Capitation Fee Settlement: Source of the New Funds.

AFTER all the winged words which have been uttered about raiding approved society funds and robbing insured persons of their "additional" benefits, it is interesting to note how the capitation fee of 9*s.* is to be provided. The source of the balance required to make up the fee from the sum of 7*s.* 3*d.* allowed by the Insurance Act to the 9*s.* granted by the Court of Inquiry is disclosed in the Bill introduced on March 31st by the Minister of Health (see Parliamentary Intelligence, THE LANCET, April 5th, p. 732). The dispute between the doctors and the approved societies as to who should pay the increased cost has been settled by the discovery of what may be called windfalls or unallocated reserves, on which the Government will draw for the purpose of increasing the medical benefit by the necessary sum. The increased cost, which is estimated at £1,350,000 per annum, is to be obtained from the unclaimed balance of insurance stamps and the excess interest earned on insurance funds. The first fund, which amounts to nearly £6,000,000, is due to the sale of stamps which since 1912 have never been claimed. The improvident people who bought these stamps have never joined an approved society, and hence no individual society can claim the money. The second fund is due to the fact that the Ministry was able during the war to invest the insurance funds at 6 per cent. and at that high rate of interest a fund accumulated which now stands at £2,000,000. The prescribed rate of interest being only 4½ per cent., there is a balance of 1½ per cent. to which the societies have no claim. The contention of the insurance medical service that the insurance funds were ample to provide what it considered an adequate capitation fee has been abundantly justified. The settlement is for three and possibly four years.

Ethical Committees in the Insurance System.

A new committee has been set up by the London Panel Committee for the purpose of carrying out the new duties allotted to panel committees under Article 28 (2) of the Medical Benefit Regulations (No. 2), 1923. This committee, styled the Ethical Subcommittee, is to consider all questions which come or are brought to the knowledge of the panel committee affecting the efficiency of the medical service. This is the first sign of the carrying out of an undertaking given by the insurance medical service to the approved societies that it would be responsible for the disciplinary control of the service to a much greater extent than heretofore.

Auto-Suggestion Outside the Range of Panel Practice.

At a recent meeting of the Lancashire Insurance Committee it was explained that a finding of the panel committee—to the effect that treatment of an insured person by auto-suggestion was beyond the competence of the ordinary practitioner and so outside the terms of his agreement with the insurance committee—did not imply expenditure on such treatment out of insurance funds. If the treatment was wished for in such cases and the medical man was willing to give it, it was treatment outside his agreement, and he could make his own terms with his patient with regard to it.

LONDON SCHOOL OF HYGIENE AND TROPICAL MEDICINE.—The Ministry of Health announce that a Royal Charter has been granted for the incorporation of the Governing Body of the School, which is to be established as a result of the donation of $2,000,000 given by the Rockefeller Foundation for the purpose.

Correspondence.

"Audi alteram partem."

"BLIND CÆCOSTOMY."

To the Editor of THE LANCET.

SIR,—Mr. J. E. Adams's criticism of the operation of "blind cæcostomy" in your issue of April 5th will, I am sure, meet with considerable support among the younger surgeons, to whom falls the task of operating upon many of these cases of acute intestinal obstruction in old people. During two years of emergency operating at Guy's Hospital I developed an increasing aversion to this expedient, and this dislike is shared by my surgical contemporaries.

Mr. Adams has pointed out the occasional occurrence of a simultaneous obstruction of the large and small intestines by a growth, a condition which cannot be diagnosed without laparotomy, and in which a blind cæcostomy would not only be useless, but would allow the chance of a life-saving operation to slip by. A further disadvantage is that a second operation is always required if the patient survives, and that no data are available for the information of the patient or the guidance of the surgeon. Laparotomy allows us, if the growth be inoperable, to perform at once a permanent colostomy in the correct position, and if it be removable, to drain the intestine at a point which will best relieve the obstruction and facilitate subsequent resection. I do not believe that cæcostomy provides really efficient drainage of the colon except in its proximal half. I was deeply impressed by a case of acute obstruction due to a growth at the pelvi-rectal junction, which died from rupture of the bowel just above the site of obstruction four days after I had established a cæcostomy.

Where the obstruction is in the ascending or transverse colon cæcostomy is in any case the operation of choice, but the cæcum is often found distended almost to bursting-point with multiple linear ruptures of the peritoneal coat, and drainage is more easily, rapidly, and safely performed through a median incision into which the cæcum can be brought out and packed off, than through a small opening directly over it, which involves the risk of rupture and escape of highly toxic contents into the peritoneum. These cases die after the relief of the obstruction, in many instances, from a low-grade peritonitis due to the presence in the abdomen of infected fluid and blood which has exuded from the distended bowel. Blind cæcostomy will not avert this tragedy; laparotomy, on the other hand, allows gauze to be packed into the pelvis to mop up fluid while drainage is being established.

I do not believe that a rapid exploration under gas and oxygen carries greater risk to the patient than a blind cæcostomy, and it is undoubtedly a more surgical procedure.

I am, Sir, yours faithfully,

W. H. OGILVIE.

Wimpole-street, W., April 6th, 1924.

THE UNITED KINGDOM FREE HOSPITAL INSURANCE FUND:

A CORRECTION FROM KING EDWARD'S HOSPITAL FUND FOR LONDON.

To the Editor of THE LANCET.

SIR,—It has come to the knowledge of King Edward's Hospital Fund that a circular addressed to "Employers of Labour, Tradesmen, and Philanthropists" has been issued by the "United Kingdom Free Hospital Insurance Fund," 17, Ironmonger-lane, E.C. The second paragraph of the circular reads: "In a speech on 13th April, 1921, the Prince of Wales expressed a desire that the King Edward's Hospital Fund should be assisted through some means of insurance, and the present scheme has been outlined by the copyright holder of free insurance, the success of which has been phenomenal as evidenced by all the leading newspapers of to-day."

No such statement was made by His Royal Highness. The King's Fund published on April 13th, 1921, a report which mentioned insurance as a method that should be thoroughly explored. The King's Fund has since declared itself in favour of the general principle of schemes of mass contributions as suggested by Lord Cave's Committee, and this principle has already been adopted by various hospitals and by the Hospital Saving Association. But the scheme of the United Kingdom Free Hospital Insurance Fund is not one which the King's Fund could approve.

I am, Sir, yours faithfully,

SOMERLEYTON,
Hon. Secretary, King Edward's Hospital Fund for London.

Walbrook, E.C., April 7th, 1924.

THE PANCREAS AND DIABETIC METABOLISM.

To the Editor of THE LANCET.

SIR,—In THE LANCET of April 5th Prof. Horst Oertel has attacked the view that the islands of Langerhans are secretory units for purpose of an internal secretion and produce insulin. He has not brought forward any new work, but has restated the case against this view. He has, however, completely omitted all reference to the work of F. M. Allen (*Jour. Exper. Medicine*, 1920, xxxi., 593). Allen showed that when one-eighth of the pancreas of a dog was removed it was possible to produce definite changes in the β cells of the islands of Langerhans if the animal was overfed with either sugar or starch. The α cells of the islands and the cells of the acinous portion were quite unaffected. It would take too long to describe the experiments fully, but the work seems to show conclusively that there is a very close relation between the β cells and sugar metabolism.

I am, Sir, yours faithfully,

GEORGE GRAHAM.

Devonshire-place, W., April 5th, 1924.

NEGLECT OF THE EARLY SYMPTOMS OF INSANITY.

To the Editor of THE LANCET.

SIR,—A Royal Commission to study the administration of the Lunacy Laws being about to be appointed, the present seems an opportune occasion to draw attention to an important aspect of lunacy administration.

I have notes of 296 cases of suicide by persons sane and insane, and of murders by insane persons, including four cases where the crime was only attempted, reported in the press of England and Wales between Jan. 1st and March 13th, 1924—i.e., in 73 days, or one-fifth of the year. These figures, however, only give a rate of less than 1500 a year. Evidently they do not include more than one-third of the total number of suicides that have occurred, as statistics for the year 1921 show that 3759 suicides were reported in that year, besides 1187 other deaths by violence as to which open verdicts were recorded, many, if not nearly all, of which were due to suicide. Evidently two-thirds of the suicides occurring were not reported in the press, or were overlooked by my press-cutting agency. It is therefore probably justifiable to multiply my figures as regards suicides by three in order to arrive at the real facts.

The 296 cases reported may be classified as follows: Suicides, 274; joint suicides, 3; attempted suicide, 1; murders and suicides, 5; double murder and suicide, 3; treble murder and suicide, 1; suicides after attempted murder, 3; murders, 2; attempted murders, 2; attempted murder and attempted suicide, 1; murder and attempted suicide, 1. In all, 292 suicides and 17 murders, besides attempts, occurred in 73 days—

i.e., at the rate of 1460 suicides and 85 murders per annum. And, as stated above, the number of suicides was probably treble that number.

Signs of brain disorder, more or less definite, had been noticed *before* the crime in no less than 200 cases—i.e., in over two-thirds of the cases. Insomnia, great depression, pains in the head, moroseness, silence, "neurasthenia," fits, strange or changed demeanour, desire to die, and tiredness of life were among the commonest symptoms. But only 20 of these cases were reported to have been under medical treatment. Forty-three cases were reported to have been noticed to be very insane for some time previous to the crime, suffering from delusions or hallucinations, or behaving and talking quite insanely. Twenty-one were stated to have been formerly inmates of asylums.

The newspaper notices were usually very short paragraphs, and little information as to the circumstances of the case was furnished. If the official reports of the coroners' inquests were examined I have little doubt but that the existence of symptoms of brain disorder could be demonstrated in many others of these cases. In analysing these statistics the verdict of suicide during temporary insanity has been disregarded as evidence of insanity. Fifty of the cases of suicide had already shown their suicidal tendencies by previous attempts or threats or by expressing a desire to die.

Many of the causes to which the mental breakdown was attributed are very doubtfully correct. But in 69 cases the evidence appeared to show the cause fairly definitely as follows: Physical ill-health (various diseases), 17; excessive pain from cancer, &c., 3; influenza, 5; fracture of skull, 1; the result of air-raids (shock), 4; war (strain, disease, or injury), 9; drink, 1; domestic troubles, 8; love affairs, including seduction, 3; deaths of relatives, 7; financial difficulties, 3; poverty, 2; unemployment, 6.

The fact that the 200 persons mentioned in the statistics for 73 days as having shown signs of brain disorder before the crime, and perhaps 578 persons in the same period if we treble the figures of the suicides as suggested above, and doubtless five times as many in the whole year—i.e., nearly 3000 persons—were not placed under proper care in time to prevent their committing murder or suicide, seems to me extraordinary, and to suggest that there must be something seriously wrong with the Lunacy Laws or their administration.[1] Apparently the early stages of mental disorder, the condition in the majority of these cases, failed to receive adequate treatment. There is a very natural reluctance to proceed at once to the extreme measure of certification. Meanwhile the tragedy occurs, because short of certification no adequate steps can usually be legally taken, the law not allowing detention except after this drastic measure. The proposed Mental Treatment Bill is calculated to amend the present state of affairs. There are reasons, however, for thinking that no great improvement is to be expected until another radical change is made in procedure—viz., the withdrawal from the jury of the issue of insanity at all trials, and its reference to expert medico-psychologists.

The recent lunacy case, Harnett *v.* Bond and another, has intensified the already prevalent hesitation of doctors to certify insanity, especially in its earlier stages. Dr. H. Rayner points out in THE LANCET of March 15th that a private practitioner, not being a Government servant, should not be required to take any responsible part in carrying out an act prescribed by law, his duty consisting in advice as to the treatment necessary. He should not be held responsible for whatever action the authorities choose to take upon his opinion. The law, however, may object to accept certificates unless responsibility is cast on their framers. A solution of the question might be found by imposing the duty of certification on special medical officials, as it is an act prescribed by law. This proposal would also probably have the additional advantage that the official certifier would presumably be an expert medico-psychologist, as is not usually the case at present. The official would be responsible to his administrative superiors if he did not exercise due care.

The drawbacks of the jury system would, however, remain in criminal trials, in lunacy inquisitions and in civil actions.—I am, Sir, yours faithfully,

JOHN WARNOCK,
Late Director, Lunacy Division, Ministry of the Interior, Cairo.

Addison-road, London, W., March 21st, 1924.

[1] While 22,740 persons were certified and treated in 1922 under the laws, nearly 3000 a year do not receive proper treatment and suffer violent deaths in consequence, besides killing their neighbours in many cases.

CERTIFICATES OF INSANITY.

To the Editor of THE LANCET.

SIR,—I apologise if I misunderstood Dr. Eager, but his first letter, following that of Dr. Rayner, did seem to suggest that professional etiquette forbade our revealing to certified patients the reasons for their confinement. In his letter last week he seems even to emphasise this position, for he says, "In other words, are they [certificates] not of the nature of confidential statements furnished by one doctor to another?" Dr. Eager refers to Dr. Macnamara's letter, which pleads for secrecy on therapeutic grounds, but does not indicate what classes of cases would be harmed nor what harm they would suffer through being shown their certificates. Dr. Macnamara appears to have in mind insanity with gross derangement of intellectual functions; but no one proposed to show these patients their certificates. There is, as he says, "no point in it," but equally there would be no harm. The cases that here concern us are the hypomanics and paranoiacs, and I should be interested to know precisely how Dr. Macnamara thinks these diseases would be aggravated by the procedure in question. Emphatic generalities are not sufficient; we want definite and reasoned objections, for it seems quite probable that an attempt might be made to enact that all patients must be shown their certificates. Even from the therapeutic point of view it seems to me that the balance of advantage is on the side of non-concealment.

I am, Sir, yours faithfully,

Perth, April 6th, 1924. IAN D. SUTTIE.

PREPARING HANDS AND GLOVES FOR OPERATION.

To the Editor of THE LANCET.

SIR,—In 1906, when the use of rubber gloves in surgery was becoming common in this country, I tried the effect of mechanically cleansing them under running water, the gloves being on the hands. After dipping the fingers into a mixture of pus obtained from a dental abscess and from an ischio-rectal abscess and thoroughly soiling them, I held them under a rose tap and worked the fingers against each other until all apparent trace of pus had disappeared. I then rubbed the fingers on agar plates. No growth was obtained with either the smooth or the crenated gloves, but after opening an abscess in a fat patient I found growth occurred. I tried this again but could never be sure of getting a sterile surface in a crenated glove covered with fat and pus, although the growths were few and small. Whether the fat dissolved the rubber or merely clung to it and anchored the bacilli I do not know. I have not repeated the experiments with a modern glove, but have frequently relied on them especially for examination and dressing.

The first thing we did on moving into our operation theatre at the 43rd General Hospital in Salonika was to improvise a rose tap and elbow-piece. In handling a large number of heavily infected cases in rapid succession with a small staff and overworked sterilising appliances the risk of trusting to mechanical cleansing

by running water seemed to me to be far less than that involved in waiting for possibly more certain measures. The method is very useful also in dealing with a large complicated wound in which only partial excision as against complete excision is possible. The great saving of time and labour and the reasonable certainty of the surface of the rubber being sterile make all exact experiments to establish the degree of risk of great importance. The method will appeal to those who, like myself, prefer to have the interior of the glove dry, and not to use a glove put on full of water. Surgically the factors of new or old rubber, fat, mucus, fæcal material, and dead epithelium (which tends to stick to rubber) come in. Ether, petrol, turpentine, and other substances in common surgical use are solvents of rubber in greater or less degree. Different organisms may cling in unequal degree to the surface of the rubber.

The trials suggested themselves to me when listening to Klein describing his experiments on testing oysters for typhoid. He washed the shells in a bath of running water. Anyone who has experimented with the dilution of coloured solutions knows how important it is to completely empty the bath of solution—that is to say, several complete emptyings and fillings yield a less coloured, final result than is obtained for the same added volume if merely run in and allowed to run out continuously. Washing gloves under a running tap approximates to the ideal in this respect as the volume held on the surface of the glove is relatively small.

I am, Sir, yours faithfully,

Aberdeen, April 4th, 1924. G. H. COLT.

INSULIN BY THE SKIN AND MOUTH.

To the Editor of THE LANCET.

SIR,—With reference to the annotation with this heading in your issue of Feb. 23rd I should like to ask whether insulin has ever been tried by the rectum. If not, perhaps readers who are in a position to do so would try this route, giving watery or oily suspensions of small bulk after an evacuation of the lower bowel, and publishing their results.

I am, Sir, yours faithfully,

H. H. KING,
Major, I.M.S.

Central Research Institute, Kasauli,
March 20th, 1924.

Obituary.

FREDERICK WILLIAM HIGGS, M.D., M.R.C.P. LOND.

Dr. F. W. Higgs, medical officer to the Ministry of Health, whose death on March 26th we regret to announce, was born on May 18th, 1881, the eldest son of Dr. Augustus W. Higgs, of Chelsea. He entered St. George's Hospital in August, 1898, where he was a successful student and took several prizes, including the William Brown Scholarship and Exhibition. Qualifying L.S.A. in 1904, he held in succession the usual junior house appointments at the hospital and proceeded to the M.B., B.S. Lond. in 1906, gaining the M.R.C.P. in 1907, and his M.D. in 1911. After giving up residence at St. George's he held several of the junior appointments in the medical school, such as assistant curator of the museum and demonstrator of materia medica. He was one of the most efficient medical registrars that the hospital has had of late years, and on more than one occasion he undertook some of the duties of the dean or warden of the school as it was then termed, while he was for a short period temporary assistant physician to the hospital. On starting practice Higgs specialised in diseases of children and was for a time physician to the Belgrave Hospital for Children. He was a capable clinician, a careful and conscientious physician, and it was to the regret of his friends that he decided, about the year 1909, to give up consulting for departmental work, for which, it is true, his orderly and methodical mind was peculiarly adapted. He joined the Public Health (Education) Department of the London County Council and was for some years in charge of one of the London districts. On his return from the war he became a medical officer to the Ministry of Health.

From the days of his house surgeoncy Higgs had been keenly interested in military matters, and as major in the R.A.M.C. (T.F.) he was called up on active service at the outbreak of the war, but on account of an old cardiac lesion he was not allowed to go to the front with his casualty clearing station, in the details of the organisation of which he had taken endless pains. In 1915 he was considered fit for active service and served in France for three years, was twice mentioned in despatches, and received the C.B.E. Early in 1920 he was gazetted as colonel A.D.M.S., 2nd London Division. He had recently been appointed county director for London on the Central V.A.D. Council. Higgs took up the livery of the Society of Apothecaries in 1919. A keen Freemason, he had passed the chair in the Lanesborough Lodge in connexion with St. George's Hospital, in which lodge he had been initiated in 1907.

The funeral service took place on March 29th and was conducted with full military honours.

Dr. Higgs married Dorothy, daughter of Dr. J. Walter Scott, of Chandler's Ford, Hants, and late of Tulse Hill, and had two daughters; to his family and to his parents we extend our sincere sympathy in their bereavement.

FREDERICK WOMACK, M.B., B.Sc. LOND.

Dr. Womack's death on March 11th removes one who made it his life work to make ancillary science acceptable to the medical student, a not inconsiderable task in these days. Born in 1857, Frederick Womack entered St. Bartholomew's Hospital at the age of 21, and remained associated with the hospital until the time of his death. He graduated B.Sc. honours in 1881 and M.B. Lond. in 1884. In the former year he was appointed teacher of mathematics to the matriculation class which was then held and became demonstrator of what was still known as "natural philosophy." In 1892, when a separate lectureship in physics was instituted, Dr. Womack became lecturer. He was also lecturer in physics at Bedford College for Women, consultant toxicologist to a number of London coroners, and found time to lecture for the University Extension. He was an ardent national volunteer, and during the war visited France to lecture to troops in rest camps. Dr. Womack's attractive personality gained him a wide circle of friends, to whom his ability in music and story-telling made appeal. His long and painful illness was borne with fortitude.

WILLIAM ALFRED WILLS, M.D., F.R.C.P. LOND.

Dr. W. A. Wills, consulting physician to the Queen's Hospital for Children, died at Rotherhill, Midhurst, on April 1st, aged 61. Born in 1863, he was a son of the late Sir Alfred Wills, who had a distinguished career at the Bar. Dr. Wills received his professional education at Westminster Hospital, and qualified M.R.C.S. Eng. in 1884. A year later he took the degree of M.B. Lond. with honours. In 1890 he proceeded to the M.D. Lond., and in 1902 he was elected a Fellow of the Royal College of Physicians. He was for some time physician at St. Marylebone General Dispensary and at Westminster Hospital, and at the latter was the author of the annual reports of the Medical Register of the Hospital from 1888 to 1892. He was afterwards appointed physician at what was then called the North-Eastern Hospital for Children. During his long career of activity in London he found time to contribute many and various articles to medical literature. In 1897 a monograph by him on Diseases of the Mouth appeared in Allbutt's "System of Medicine," and in 1901 he wrote on Mountain Sickness in Quain's "Dictionary of Medicine." Some of his work appeared in THE LANCET in 1896 and in

1901. On his retirement from professional activities he settled down in Midhurst, Sussex, where he identified himself with all branches of public work. He became a member of the West Sussex County Council, was placed on the Commission of the Peace for West Sussex, and was one of the justices appointed under the Lunacy Act as a visitor to asylums. Nursing work always claimed his enthusiastic support, and by his death the West Sussex Nursing Association has lost one of its valued helpers and advisers. Dr. Wills was a man of generous nature who made many friends, not least among the poor. Of his recreations, the chief was Alpine climbing, and he acted as secretary of the Alpine Club, of which his father was one of the founders. His funeral, which was largely attended, took place at Stedham on April 4th.

WILLIAM HENRY COATES, M.B. DURH., M.R.C.S. ENG.

WE regret to record the recent death, at his residence, Bleak House, Patrington, Holderness, of Dr. W. H. Coates, one of the best-known medical men in the East Riding of Yorkshire. Born in York over 60 years ago, his public record as physician, surgeon, barrister, county councillor, and administrator must be well-nigh unique. He studied at the University of Durham, where he took the M.A. and M.B. in 1888, and where he acted as a demonstrator of anatomy, and later at the London Hospital he was a demonstrator in histology. In 1889 he became M.R.C.S. and L.R.C.P. Lond. In his spare time he qualified as a Barrister-at-law, and was called to the Inner Temple in 1899. His professional appointments were many and varied, and included that of medical officer of health for Patrington, public vaccinator, chemical analyst, medical officer to Linsdale's Hospital, certifying factory surgeon, and surgeon to Trinity House. He was also a member of the North Sea Fisheries Commission, and consulting surgeon to Lloyds and the U.S.A. Consulate. During the war he was medical officer for two hospitals and several military camps in South Holderness with 1800 men in his charge, and he acted as local food and fuel controller. He was interested in politics, and on two occasions he refused invitations to be nominated as a candidate for Parliament. In his early years in London he had many friends amongst journalists, and was on occasion an active worker and writer of leaders and a dramatic critic. He also took a keen interest in chemical matters, and in 1891 published a book entitled "Food: Its History and Adulterations," and in 1899 contributed an article to THE LANCET on Poisoning by Mercuric Chloride.

Dr. Coates was a man of brilliant and versatile powers, and his death will be a loss to South Holderness, where he had many friends.

EDWIN CLAUDE TAYLOR, M.D., M.S. LOND., F.R.C.S. ENG.

Dr. Claude Taylor, who died at Birmingham on March 29th in his fifty-fourth year, was a man of very high academic attainment who deliberately chose to go into general practice as a form of social service. He was educated at Caius College, Cambridge, passing on to Guy's Hospital for his clinical work. After qualifying in 1894 he held appointments as house surgeon and resident obstetrician at Guy's and assistant medical officer at the London Temperance Hospital. During this period he took in succession the M.D. Lond., F.R.C.S. Eng., and M.S. Lond. In 1898 he settled in Hampstead, where he acquired a very large general practice, the claims of which did not prevent him finding time for work in connexion with child welfare and temperance. He was visiting medical officer to the Hampstead Infirmary, where he originated the idea of the nurses being able to qualify for their full certificate with Poor-law hospital experience. During the war the infirmary became a military hospital to which Dr. Taylor acted as visiting physician. Owing to failing health he gave up practice in the autumn of 1922 and sought on the Riviera a renewal of vigour which unfortunately did not return. At a memorial service held at the Friends' Meeting House, Bourneville, on April 2nd, Sir George Newman said: "The love of a medical man for his craft must always be associated with love of humanity and that Dr. Taylor had in an exceptional degree; and so he became a great doctor, a great physician, and a good surgeon." Mr. W. McAdam Eccles writes: "As one who had a very close professional and friendly relationship with Dr. Claude Taylor, I am proud to bear testimony to the fine example he set. He was untiring in his care of patients, skilled in diagnosis, sound in treatment. He was ever ready, while holding some advanced views on certain matters of medical politics, to discuss and argue differences with an open mind and restraint. He was keen on the moderate and scientific view of the alcohol question, and did much to help forward the dissemination of sane knowledge thereon. His loss will be felt widely, not least by those with whom he was professionally connected."

Dr. Taylor married Miss Huldah Southall, of Birmingham, and had five children, of whom two sons are following the medical profession. Much sympathy is felt with his family in their loss.

THOMAS RIDGE JONES, M.D. ABERD., M.R.C.S. ENG.

Dr. Ridge Jones, whose death took place on April 4th after several years of ill-health, was intimately connected with the Victoria Hospital for Children in London for over 40 years. A son of Thomas Jones, of Rhyl, North Wales, he was born in 1840, and obtained his early education at the Liverpool Institute. He proceeded to the study of medicine at the medical colleges of Middlesex and St. George's Hospitals. As a student Dr. Jones had a brilliant career, and whilst at the Middlesex Hospital he gained the Governors Prize "for the most distinguished student at the Middlesex Hospital." He qualified L.S.A. in 1860 and M.R.C.S. Eng. in the following year. Continuing his medical studies, he went subsequently to Aberdeen University, where, in 1869, he graduated M.B. and in the following year gained his M.D. His first appointment brought him back to London to be resident medical officer at St. George's Hospital, and after filling this post for 11 years he joined the staff of the Victoria Hospital for Sick Children which had recently been founded. To Dr. Jones's support and service the Victoria Hospital owes not a little of its present prosperity, and during the 26 years in which he acted as hospital physician he saw many improvements and extensions take place. At the termination of his 26 years' service as acting physician to the hospital he was appointed as consultant. Of Dr. Jones's contributions to medical literature may be mentioned a study of an outbreak of small-pox which occurred in St. George's Hospital and published in the hospital reports. He was specially interested in the study of cerebral hæmorrhage, of which malady he himself was the victim some three years ago and which finally caused his death. Dr. Jones had a large consulting practice apart from his hospital duties; the care of children was always his first interest. He never actually retired, but latterly was obliged to lead a less strenuous life, although his faculties remained unimpaired. In 1876 he married Ruth, daughter of Dr. Joseph Ridge. To his widow and family we extend our sincere sympathy.

WEST KENT MEDICO-CHIRURGICAL SOCIETY.—A meeting of this society will be held to-day (Friday) at the Miller General Hospital, Greenwich, at 8.45 P.M., when Mr. P. P. Cole will give a communication on the Surgery of the Face and Jaws. The President, Dr. E. G. Annis, will occupy the chair.

Parliamentary Intelligence.

NOTES ON CURRENT TOPICS.

Protection Against Lead Poisoning.

ON April 3rd Mr. HENDERSON (Home Secretary) presented a Bill "to make better provision for the protection against lead poisoning of persons employed in painting buildings." The Bill was read a first time.

National Health Insurance (Cost of Medical Benefit) Bill.

The National Health Insurance (Cost of Medical Benefit) Bill was considered by Standing Committee "C" of the House of Commons on Tuesday, April 8th. Mr. A. SHORT presided.

Mr. HARVEY moved an amendment to delete paragraph (*b*) of Subsection 2 of Clause 1 in order to elicit from the Minister of Health some assurance that the Government would see that the interests of those who did not belong to approved societies were adequately protected.

Mr. WHEATLEY said that if he accepted the amendment it would upset the scheme of the Bill. But there was no danger at all of any insured people suffering from the scheme of finance contained in the Bill. The Government had gone into the matter very carefully and they found that after making all essential reserves—and even generous reserves—they would have plenty of money for the purpose.

The amendment was by leave withdrawn.

On the question that the Bill be reported without amendment to the House,

Sir KINGSLEY WOOD asked the Minister of Health if he would explain to the Committee the exact position in regard to the setting up of the Royal Commission to examine the whole system of national insurance.

Mr. WHEATLEY said that the negotiations for setting up the Royal Commission were very well advanced. He had submitted the terms of reference to the approved societies and the doctors and they had agreed to them. They had now to be submitted to another body before it would be proper to report them to the public, but he anticipated no difficulty in the matter. With regard to the personnel of the Commission hon. Members would realise that he was not alone responsible for determining that. He had to negotiate with the people interested and receive the authority of the Government as a whole. But there again he did not think there would be any difficulty, and he anticipated no delay.

Sir KINGSLEY WOOD: Will the personnel include representatives of the various interests affected?

Mr. WHEATLEY: You are raising a point which is one on which I might very easily slip.

Mr. PERRY suggested that the Commission ought to consider whether the method of stamping cards should be continued under any revised scheme of national health insurance administration.

Sir W. JOYNSON-HICKS urged that the Commission should be an impartial body. When he was Minister of Health he received the consent of a very well-known man, not of his own political persuasion, to occupy the position of chairman. It was of great importance that the tribunal should command the confidence and support of the House of Commons and the country generally.

Mr. FALCONER said that there was a great danger that people would be put on the Commission who were most excellent members of the community, but who had no real knowledge of the problems of national insurance. Under those circumstances the work of the Commission would be an almost hopeless one. He agreed that the chairman ought to be a man outside any of the interests affected.

Mr. B. TILLETT said that he hoped that the Minister would not appoint a Commission of experts.

Mr. MASTERMAN pointed out the desirability of urging the Commission to report as promptly as possible.

Lt.-Col. FREMANTLE said that while he was not qualified to speak on behalf of the doctors, he believed that their position was this: the medical profession would not wish to be represented on the Commission if it was decided that it should not be a Committee of experts, but they would raise strong objection if, after that decision had been taken, representatives of approved societies and so forth were included. The doctors hoped that, whether experts were to be placed on the Commission or not, the profession would be treated fairly and that the whole matter would be given a considered and impartial judgment. If that were so, the doctors had perfect confidence in the justice of their case where it came into conflict with the views of other persons.

Mr. WHEATLEY, replying to the points raised, said that he could not promise that the Commission, however it was selected, would report in a very short time. The question which it would have to consider was a very complicated one and the inquiry would take time. As regarded the suggestions which had been made he would give due weight to all of them, but the Committee must recognise that a storm would break around his head immediately he had appointed the Commission, no matter what course he adopted.

The Committee stage of the Bill was concluded.

HOUSE OF LORDS.

TUESDAY, APRIL 8TH.

Therapeutic Substances Bill.

Earl DE LA WARR, on behalf of the Ministry of Health, moved the second reading of the Therapeutic Substances Bill, a measure to provide for the regulation of the manufacture, sale, and importation of vaccines, sera, and other therapeutic substances. He said the measure was non-contentious.

The substances to which the Bill applies are vaccines, sera, toxins, antitoxins and antigens, salvarsan (dioxy-diamino-arseno-benzol-di-hydrochloride) and analogous substances used for the specific treatment of infective disease; preparations of the specific antidiabetic principle of the pancreas known as insulin, and preparations of the posterior lobe of the pituitary body intended for use by injection.

Clause 1 provides that no person shall manufacture for sale any of these substances unless he has a licence granted by the Minister of Health, the Scottish Board of Health, or the Minister of Home Affairs for Northern Ireland. Applicants for licences must satisfy the licensing authority that the conditions under which the therapeutic substances are to be manufactured comply with the regulations under the Act. Licences may be revoked for failure to comply with the conditions attaching to them, and the regulations under the Act as to standards of strength, quality, and purity. Nothing in the section shall apply to the preparation by a registered medical practitioner of the substances in question. Clause 3 places restrictions on the importation of such substances into Great Britain or Northern Ireland. Clause 4 provides for the establishment of a joint committee consisting of the Minister of Health (chairman); the Secretary for Scotland; and the Minister of Home Affairs for Northern Ireland; and also an advisory committee to assist the joint committee, one member appointed by the Minister of Health, who shall be chairman, one by the Scottish Board of Health, one by the Minister of Home Affairs for Northern Ireland, one by the Medical Research Council, one by the General Medical Council, and one by the Council of the Pharmaceutical Society of Great Britain. Clause 5 gives power to the joint committee, after consultation with the advisory committee, to make regulations for various purposes.

The Bill was read a second time.

HOUSE OF COMMONS.

WEDNESDAY, APRIL 2ND.

Inquiry into Lunacy Laws.

Mrs. WINTRINGHAM asked the Minister of Health what interests would be represented on the committee appointed to inquire into the Lunacy Laws.—Mr. GREENWOOD (Parliamentary Secretary to the Ministry of Health) replied: It is not intended that the body appointed to inquire into the Lunacy Laws shall be composed of representatives of interests. The aim of the Government will be to set up a small impartial body of persons qualified to deal with the legal and medical issues and the questions of public policy involved in this inquiry.

Village Settlements for Tuberculous Men.

Mr. PHILIP OLIVER asked the Minister of Health which village settlements for tuberculous ex-Service men had been allotted grants to meet the cost of the erection of cottages and the amounts of such grants; why no grant had been made to the East Lancashire tuberculosis colony at Barrowmore; and would he consider the making of such a grant in the immediate future.—Mr. GREENWOOD replied: The village settlements in question are at Papworth and Preston Hall, and £10,000 has been allotted to each for this purpose. As regards Barrowmore, my right hon. friend understands that at the suggestion of one of his predecessors the Joint Finance Committee of the British Red Cross Society and the Order of St. John of Jerusalem have voted the sum of £10,000 to the East Lancashire Tuberculosis Colony in order that cottages may be provided there for tuberculous ex-Service men. My right hon. friend has called for a report as to the present position at Barrowmore and the need for any further development.

Local Tribunals under Midwives Board.

Mr. SHORT asked the Minister of Health whether, seeing that registered midwives who contravene the regulations are summoned to appear before a tribunal in London,

entailing great expense to the person so appearing, he would consider the appointment of area tribunals to deal with such cases.—Mr. GREENWOOD replied: The duty of deciding upon the removal from the roll of midwives of the name of any midwife for disobeying the rules and regulations of the Central Midwives Board, or for any other misconduct, is imposed by Statute upon that Board, and my right hon. friend does not think it would be possible to arrange for such cases to be dealt with by area tribunals. Many disciplinary cases of a minor character are dealt with locally by the local supervising authorities. I may add that the Central Midwives Board are empowered to defray the expenses incurred by any midwife who may be required to appear before them in her own defence.

Government Lymph Establishment at Hendon.

Mr. BLACK asked the Minister of Health how many calves at the Hendon Institute were under vaccination at the same time, and what was the source of the lymph with which they were vaccinated.—Mr. GREENWOOD replied: The number of calves vaccinated week by week at the Government lymph establishment varies according to the demand for lymph, the supplies in stock, and other circumstances. The lymph at present used at this establishment is a strain of lymph obtained many years ago which has been carried on by repeated transference from calf to calf.

Medical Benefit for Dependents of Insured Persons.

Mr. NIXON asked the Minister of Health if he would arrange that the question of providing medical benefit under the National Health Insurance system for the wives and children of insured persons be inquired into by the Royal Commission which he proposed to set up.—Mr. GREENWOOD replied: My right hon. friend has no doubt that the subject referred to by the hon. Member will be included amongst the matters which will come under the consideration of the Royal Commission.

Cancer in Birmingham.

Mr. ALFRED T. DAVIES asked the Minister of Health whether his attention had been directed to the appointment of a special committee by the Birmingham City Council to inquire concerning the prevalence of cancer in the city, the facilities for treatment of the disease, and the steps which might usefully be taken by their council to help cancer sufferers; whether similar committees had been appointed in other counties, cities, or towns; whether he approved of such local committees, and would give them encouragement where possible; and whether he would direct the attention of county, city, and town councils and other public bodies to the action taken at Birmingham.—Mr. WHEATLEY replied: The answer to the first part of the question is Yes. My Departmental Committee on Cancer is in touch with the medical officers of health of several other towns with a view to the prosecution of similar inquiries either through special committees or otherwise, as may be most suited to the area concerned. The formation of such local committees has my cordial approval, and I may refer to the suggestions on this point contained in the memorandum on cancer issued by my predecessor to all local authorities in England and Wales in August of last year.

Tuberculin-tested Milk.

Mr. MILLS asked the Minister of Health what number of licences had been granted during each of the years 1920, 1921, 1922, and 1923 to producers, to retail distributors, and to wholesale distributors of milk, to use each of the following designations: Certified, Grade A tuberculin tested, and Grade A pasteurised.—Mr. GREENWOOD replied: According to the records in the department, the numbers of licences in operation at the end of each of the years 1920–23 were as follows:—

—	1920.	1921.	1922.	1923.
Certified—				
Producers	9	23	41	55
Shops	10	49	170	598*
Grade A (tuberculin tested)—				
Producers	11	15	22	46
Bottling establishments / Shops	8	11	17	26* / 118*
Grade A—				
Producers	—	—	—	50*
Bottling establishments	—	—	—	24*
Shops	—	—	—	115*
Pasteurised—				
Pasteurising establishments	—	—	—	57*
Shops	—	—	—	107*

Up to the end of 1922 the special designations were "Grade A (Certified)" and "Grade A." The conditions applying to these designations were nearly the same as those now applying to "Certified" and "Grade A (Tuberculin Tested)" respectively. The licences whose numbers are marked with an asterisk were issued by local authorities and the numbers given may possibly not be quite complete.

Health Insurance Administration.

Sir ROWLAND BLADES asked the Minister of Health the actual amount expended on administration and other costs of working by the approved societies in the year 1922; the actual amount expended on administration by the National Health Commission in the same year; the amount of any other expenditure incurred in the administration of the Act by the insurance committees or other bodies, excluding payments to medical practitioners; and what rates these expenses are to the actual contributions from all sources, save Government grants in aid, received during the year.—Mr. WHEATLEY replied: The amounts expended on administration of National Health Insurance in England and Wales in the year 1922 were as follows: Approved societies, £2,913,000; Ministry of Health and other Government departments, including National Insurance Audit Department and Government Actuary's Department, £1,010,000; insurance committees, £378,000. Excluding Government grants in aid received during the year from the actual contributions and expenditure of Government departments on administration, the ratio of administration expenditure to contributions from all sources is 12¾ per cent.

Joint Advisory Committee on Milk Production.

Mrs. WINTRINGHAM asked the Minister of Health what interests were represented by the various members of the joint committee appointed to advise on matters concerning the production, handling, and distribution of milk and dairy produce.—Mr. GREENWOOD replied: The bodies represented on the committee are the National Farmers Union, the National Federation of Dairymen's Associations, the Parliamentary Committee of the Co-operative Congress, the National Association of Creamery Proprietors and Wholesale Dairymen, the National Clean Milk Society, and the London and Provincial Master Dairymen's Association.

THURSDAY, APRIL 3RD.

Richmond and Orpington Hospitals.

Mr. SOMERVILLE HASTINGS asked the Minister of Pensions the number of empty beds in Richmond Park and Orpington Hospitals respectively, and whether and how he proposed to utilise these hospitals in future.—Mr. F. O. ROBERTS replied: The numbers are 36 and 67 respectively, all of which are, however, allocated to patients about to commence treatment. It may not be necessary to retain the hospital at Richmond Park after next autumn, but there is at present no prospects of the accommodation at Orpington ceasing to be required by my department.

Ex-officer's Removal to Mental Hospital.

Mr. COSTELLO asked the Minister of Pensions whether he received a communication, dated Feb. 29th, 1924, from a pensioned ex-officer, at that time an inmate of Haydock private asylum, Newton-le-Willows, Lancashire, in which that officer asked for a medical examination and inquiry into his case with a view to showing that he was perfectly sane; what was the reason why this officer was, in October, 1923, summoned to a Ministry of Pensions hospital at Knotty Ash, Liverpool, in order to proceed to the Isle of Wight for convalescence, and that instead of that he was taken to the above-named asylum without his wife or any of his relatives being informed of his removal thereto: why was he detained as a lunatic until March 4th, 1924, upon which date he escaped and, after remaining in seclusion for the statutory interval of 14 days, recovered his freedom; is he aware that this officer was awarded 100 per cent. disability for severe wounds and that the pension is now being held up, if not entirely stopped; and would he cause inquiries to be made with a view to taking action for remedying these matters.—Mr. F. O. ROBERTS replied: I regret to say that this officer, who had been awarded disability retired pay at the maximum rate, had, after admission to Knotty Ash Hospital, to be transferred, under an urgency order to a mental hospital. The proposed convalescent treatment could not therefore be proceeded with. As the hon. Member states, the officer escaped from the mental institution, and as this happened about the time of receipt of the letter referred to in the first part of the question, the medical examination he asked for could not be made. With regard to the last part of the question, whilst the officer was in the mental hospital arrangements were made for payments due to him to be made to his wife, but in the present circumstances payment will be made to him direct.

Military Hospital at Craigleith.

The EARL OF DALKEITH asked the Minister of Pensions whether it was the intention of the Government to close down the military hospital at Craigleith; and what were their reasons for doing so.—Mr. F. O. ROBERTS replied: In view of the decline in the requirements of my department for accommodation for in-patients in Scotland I am making arrangements to give up this hospital next autumn.

Medical Evidence in Final Pension Awards.

Sir ROBERT ASKE asked the Minister of Pensions what kind of evidence would be accepted by him as showing that an award was erroneously declared final; whether medical evidence was essential for this purpose; and whether he would pay the applicant's doctors' fees for examination and report as to errors in awards.—Mr. F. O. ROBERTS replied: The question whether an award was made final in error owing to incorrect diagnosis will be determined on the results of examination by a Special Medical Board of the Ministry. Ordinarily it is anticipated that such cases, which are not numerous, will be discovered in the course of medical treatment by the Ministry.

MONDAY, APRIL 7TH.

Medical Services in Bengal.

Lieut.-Colonel HOWARD-BURY asked the Under-Secretary of State for India whether he was aware that owing to the reduction in the estimates for the educational and medical services in Bengal, passed by the Bengal Legislative Council, the Government were now forced to dispense with the services of all officers in those departments whose salaries had not been voted, and that 700 had been dismissed; and what steps it was proposed to take to carry on these services.—Mr. RICHARDS replied: The facts are substantially as stated by the hon. and gallant Member. The precise number of officers who have been given notice, three months in every case, is 703. My noble friend, the Secretary of State, has the matter under consideration.

Experimental Inoculations of Animals.

Mr. PETHICK LAWRENCE asked the Minister of Agriculture whether the proposal to bring all experimental inoculations of animals with the living virus of certain highly dangerous diseases under the effective control of the Board of Agriculture, originally suggested in the Board's report for the year 1919, had been considered afresh; and whether anything had been done in the matter.—Mr. BUXTON replied: The proposal referred to has been considered from time to time, and it has come up for special consideration at the present moment in connexion with the investigation of foot-and-mouth disease. I am advised that experiments with the virus of this very contagious disease should be controlled, and measures will be adopted to give effect to this view.

Epizootic Abortion in Cattle.

Mr. BLACK asked the Minister of Agriculture whether he could give any figures showing the number of heifers and cows inoculated against epizootic abortion, and the results of such inoculations during the last three years.—Mr. BUXTON replied: Such information as it has been possible to collect with regard to these inoculations is not complete or sufficient upon which to base a general conclusion. I understand, however, that in a number of selected cases particulars are being collected and I hope that it will be possible to make these the subject of a report at a later date.

Guardians and Mental Hospitals.

Mr. ALFRED T. DAVIES asked the Minister of Health whether, by an Order in Council or other means, boards of guardians might have direct representation on the committees of management of the mental hospitals in the areas such guardians represent; and whether he would favourably consider the question at an early date.—Mr. WHEATLEY replied: The answer to the first part of the question is in the negative, and I doubt if an alteration of the law in the direction suggested is likely in the immediate future.

TUESDAY, APRIL 8TH.

Recruitment of Junior R.A.M.C. Officers.

Lieut.-Col. ASSHETON POWNALL asked the Secretary of State for War what action it was proposed to take to recruit junior officers for the Royal Army Medical Corps, in view of the present serious shortage.—Mr. S. WALSH replied: The matter is receiving consideration, but I am not yet in a position to make a statement regarding it.

ROYAL EASTBOURNE EYE HOSPITAL.—The annual report of this institution submitted to the annual meeting of the subscribers on March 28th notified that during the year 1923 the extension of the hospital premises had been completed, and the institution was now in such a state of efficiency as would enable it to compare favourably with other ophthalmic hospitals. The chairman paid a tribute to the work of the hon. surgeon, Mr. Geoffrey B. Lowe, to whose economical management, aided by the matron, the present sound condition of the finances was due. New cases during the year numbered 1177, as against 848 in 1922, despite the difficulties in accommodation and the absence of an operating theatre, disadvantages which had now disappeared with the inauguration of the new ward and operating theatre in the enlarged premises.

Medical News.

UNIVERSITY OF LONDON.—A course of lectures on Medical Hydrology, supplemented by demonstrations and clinical lectures at a British spa, has been arranged by the Board to promote the extension of University teaching in coöperation with the Committee for the Study of Medical Hydrology in Great Britain. The course will begin on May 6th, and end on May 9th, 1924. Dr. R. Fortescue Fox, Prof. M. S. Pembrey, Dr. S. Judd Lewis, Dr. David Brown, Dr. Charles W. Buckley, Dr. G. L. Kerr Pringle, and Dr. W. Bertram Watson will take part in the course, and a visit will be paid to Bath on May 8th, returning May 9th. All communications with reference to the course should be addressed to the hon. secretaries, Committee for Study of Hydrology, care of University Extension Department, at the University of London, South Kensington, S.W. 7, where the lectures will for the most part be delivered.

ROYAL SOCIETY.—The President and Council of the Royal Society have received from a donor who has desired to remain anonymous a gift of £10,000 for the prosecution of original research in medicine, with special attention to tropical diseases in British possessions, and to cancer and tuberculosis. They have also received from Messrs. Brunner, Mond, and Co. a gift of 500 guineas, to be used for the publication of the results of scientific research in chemistry, physics, and similar sciences.

ROYAL COLLEGE OF PHYSICIANS OF IRELAND.—At a meeting of the President and Fellows of the Royal College of Physicians of Ireland held in the College Hall, Kildare-street, Dublin, on April 4th, Surgeon Vice-Admiral Joseph Chambers, M.D. Dub., C.B., C.M.G., hon. physician to H.M. the King, Director-General of the Medical Department of the Royal Navy, was admitted an Honorary Fellow of the College.

ROYAL MEDICAL BENEVOLENT FUND.—The annual meeting of the supporters of the Fund will be held at the rooms of the Medical Society of London, 11, Chandos-street, W. 1, at 5.30 P.M., on Tuesday next, April 15th, when the officers and committee for the ensuing year will be elected and the annual report and statement of accounts for 1923 received.

BENEKE CENTENARY.—On March 27th, the hundredth anniversary of the birth of Friedrich Wilhelm Beneke was celebrated at Bad Nauheim, where his memory is held in high esteem. Beneke was born at Celle in Hanover, became professor of medicine in the University of Marburg, and physician to the mineral springs of Nauheim, where he discovered the beneficial action of mineral baths on the heart and blood-vessels. For several years he was chief physician to the German Hospital in London, when he became closely acquainted with the organisation of hospitals and charitable institutions of the metropolis, knowledge which had its effect on his later work.

DR. SCHWEITZER'S RETURN TO AFRICA.—Dr. Albert Schweitzer, doctor of theology and doctor of music, as well as doctor of medicine, of Strasbourg, has just returned to Africa to take up again his work as a medical missionary. His sojourn in Europe during the war gave him the opportunity of lecturing and playing—he is a brilliant organist and interpreter of Bach—in this and most of the chief countries on the continent in aid of his African work, which he thus supports by his own efforts. Dr. Schweitzer paid a private visit to England last December when his suggestions that he should found, if possible, a second hospital on British territory—his original hospital is at Lambarene in the French Gaboons—were welcomed by the Colonial Office. He is now looking for a suitable site in the British Cameroons.

DONATIONS AND BEQUESTS.—By the will of the late Alderman Dr. Thomas William Thursfield, of Leamington Spa, the testator left £600 to the Warneford and South Warwickshire Hospital, Leamington, upon trust for investment and to apply the income in the improvement of the teaching of the nurses trained in that hospital, any balance being used for a medal or prize to the nurse passing the best examination, and £150 to the University of Aberdeen upon trust for investment and to apply the income for a Dr. Thursfield Gold Medal (or other award) for the best thesis for the degree of Doctor of Medicine.—Subject to certain contingent conditions the late Mr. E. Huntley of Branksome, Dorset, who left estate of the value of about £35,000, bequeathed a large residue to be equally divided between the Royal Infirmary and the Eye Infirmary, Sunderland.

Sir H. M. Mallaby-Deeley has offered to double all contributions received for the Westminster Hospital from April 2nd to June 30th, up to a total of £16,000.

Dr. F. J. Willans, M.V.O., has been appointed Surgeon Apothecary to His Majesty's Household at Sandringham in the place of Sir Alan Reeve Manby, K.C.V.O., who has resigned.

Summer-time in Great Britain will take effect on the night of Saturday–Sunday, April 12th–13th, when clocks should be advanced one hour. In France, Belgium, and Holland summer-time took effect on the night of March 29th–30th.

KING EDWARD VII. HOSPITAL, WINDSOR.—The foundation-stone of Nurses' Hostel of the hospital was laid on April 5th by H.M. Queen Mary. The hostel is being erected as a war memorial, and in memory of Sir William Shipley, the late chairman of the hospital.

CANCER HOSPITAL.—The annual dinner of the medical staff of this hospital was held at the Langham Hotel on April 2nd, with Mr. W. Ernest Miles presiding. Of the company present (about 80) more than half were guests. After the loyal toast had been honoured Mr. H. J. Waring, Vice-Chancellor of the University of London, gave the toast of the Hospital. He briefly outlined the history of its foundation in 1851 when cancer patients were not readily admitted to the general hospitals, and passed in review the recent advances made in the surgery of cancer. He discussed the ideal hospital buildings for such a purpose and concluded with a warning that in spite of all the research into the origin of cancer the only hope of cure still lay in surgery. In reply, the Chairman pointed to projected alterations in the buildings which would satisfy Mr. Waring's ideals. Though much effort and money was lavished on the electro-therapeutical department it was with the object of relieving suffering, for it was realised that at least up to the present no cures had been obtained. Sir Thomas Horder proposed the Health of the Guests, and Viscount Cave, Sir William Hale-White, and Captain Dyer, chief of the London Fire Brigade, replied. The final toast of a most successful dinner was that of the Chairman, proposed by Mr. Jocelyn Swan.

ROYAL WEST SUSSEX HOSPITAL, CHICHESTER.—Although the balance-sheet presented at the annual meeting of the governors on April 1st showed a small balance in hand, the financial position, it was explained, was a cause of some anxiety owing to the lack of definite annual subscribers. Since 1914 the annual subscriptions had been up to £1700, but they had now dropped to £1500. Despite the ever-increasing growth of the work, it was announced by the chairman that during the last four years expenditure had decreased by £3000. One very satisfactory feature of the year 1923 was the result of the Alexandra Day collection. In-patients during the year numbered 578, and out-patients 1761, who made 6713 attendances. In addition there were 1020 attendances in the X ray department, and 2509 attendances of patients for electrical massage. The great increase in the work of the X ray department had called attention to the lack of accommodation and a new arrangement was under consideration. It was also stated at the meeting that the governors were endeavouring to initiate a scheme in connexion with the training of nurses, so that nurses who went to the smaller hospitals could count two years' work there towards their certificate.

ROYAL VICTORIA HOSPITAL, BELFAST.—At the annual meeting of the hospital held on March 27th the report showed that during the year 1923 there were treated 4643 patients in the wards and 37,736 in the out-patient department. The average daily number of beds occupied was 325. The number of surgical operations performed was 2676, with a mortality of 3·44 per cent. The total number of deaths during the year was 276, which gives a mortality of 5·94 per cent. In the pathological department 1582 examinations were recorded. A follow-up department has been established to record the after-history of patients who have been treated or operated upon in the hospital. Every first and third Wednesday a laboratory meeting of the staff has been held, at which questions of clinical and pathological interest have been discussed. More than 60 diabetic patients have received treatment by insulin with very gratifying results, and in other specialised departments there was a considerable increase in the number of patients who received treatment. In the dental department, systematic orthodontic treatment for the correction of irregularities of children's teeth has been instituted. The number of students in attendance at th hospital was 319 in the winter session and 293 in the summer session. The income for the year under notice was £54,000, and the expenditure £55,000. The workpeople's contributions amounted to £19,000, an increase of over £1500 as compared with the previous year. The sum of £5100 was added to the capital account. The cost per bed was £135. During the year an extensive scheme of enlargement of the hospital has been undertaken to meet the ever-growing pressure upon its resources. Since the hospital was opened in the year 1903 the population of Belfast has increased by about 150,000, and the waiting list at the hospital never falls below 150, and sometimes exceeds 200. The building operations are now far advanced, and will afford 80 new beds, a new block for nurses, extensive additions to the extern department, and a new mortuary. New gynæcological and ophthalmic operating theatres, a common room for students, additional accommodation for the X ray department and the dental department are included in the plans. The total cost of the extensions will be about £80,000. An interesting feature of the year was the provision of the Princess Mary Cot, the funds for which were derived from the sum of money left over from the subscriptions raised by the women of Ulster to present Her Royal Highness with a wedding present. The cot was handed over to the hospital by the Duchess of Abercorn on Jan. 23rd, by whose instrumentality the sum of £250 for naming the cot was obtained. A signed photograph of Princess Mary overhangs the cot. The board records with much regret the decease of Sir John Walton Browne, D.L., one of its consulting surgeons. Professor T. Sinclair, C.B., F.R.C.S., has been appointed on the consulting staff, and has been succeeded on the visiting staff by Mr. S. T. Irwin. Mr. H. P. Malcolm has been appointed one of the assistant surgeons.

WEST KENT HOSPITAL.—The annual meeting of this hospital was held recently at Maidstone. The report of the committee of management showed an increase in the number of patients in the various departments during 1923, but the present accommodation was not sufficient to meet the requirements of the neighbourhood and there was still a long waiting list of patients. The ordinary income had increased during the year by £1727, but it was still far short of the amount needed annually, and the year ended with an adverse balance of £1225. The committee expressed their special thanks to the members of the Pay Day Fund for their continued support, as the result of which £3437 had been raised. Dr. W. Shaw, who had been hon. physician to the hospital since 1904, having resigned his office, was appointed honorary consulting physician, and Dr. G. L. Atwater was elected hon. assistant physician.

ERRATUM.—In THE LANCET of April 5th, p. 730, in announcing a meeting of the Royal Sanitary Institute, the second portion of the paragraph referred to a Congress at Bordeaux which is not that of the Royal Sanitary Institute, but of the Royal Institute of Public Health. Otherwise the information holds good.

Medical Diary.

Information to be included in this column should reach us in proper form on Tuesday, and cannot appear if it reaches us later than the first post on Wednesday morning.

SOCIETIES.

ROYAL SOCIETY OF MEDICINE, 1, Wimpole-street, W.

MEETINGS OF SECTIONS.

Monday, April 14th.

WAR: at 4.30 P.M.
Annual General Meeting:
Election of Officers and Council for 1924–25.
Paper:
Lieut.-Colonel J. A. Anderson, R.A.M.C.: The Recent Trend of Military Hygiene.
The paper will be followed by a discussion.

Tuesday, April 15th.

GENERAL MEETING OF FELLOWS: at 5 P.M.
Ballot for election to the Fellowship.

Wednesday, April 16th.

HISTORY OF MEDICINE: at 5 P.M.
Paper:
Dr. Louis W. Sambon: Preventive Medicine among the Ancients (illustrated by slides, drawings, and ancient objects).

Easter Closing.

The Society's House and Library will be closed from Thursday, April 17th, to Tuesday, April 22nd, both days inclusive.

LONDON DERMATOLOGICAL SOCIETY.

WEDNESDAY, April 16th.—4.30 P.M., A Clinical Meeting will be held at St. John's Hospital, when cases will be shown. After the meeting the Fellows' Dinner will be held at the Criterion Restaurant (price 5*s*.).

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

WEST LONDON POST-GRADUATE COLLEGE, West London Hospital, Hammersmith, W.

MONDAY, April 14th.—10 A.M., Surgical Registrar: Surgical Pathology. 12 noon, Mr. Sinclair: Surgical Diseases of the Abdomen. 2 P.M., Mr. Bishop Harman: Eye Department.

TUESDAY.—10 A.M., Mr. Steadman: Dental Department. 2 P.M., Mr. Banks-Davis: Throat, Nose, and Ear Department. 2.30 P.M., Mr. Tyrrell Gray: Surgical Wards.

WEDNESDAY.—10 A.M., Dr. Saunders: Medical Diseases of Children. 2 P.M., Dr. Burnford: Medical Wards. 2 P.M., Dr. Owen: Medical Out-patients.

THURSDAY.—11 A.M., Mr. Simson: Gynæcological Demonstration. 2 P.M., Dr. Scott Pinchin: Medical Out-patients. 2 P.M., Mr. Simmonds: Surgical Out-patients.

FRIDAY.—10.30 A.M., Dr. Scott Pinchin: Medical Wards. 12 noon, Mr. Endean: Venereal Diseases. 2 P.M., Dr. Burrell: Medical Out-patients.

SATURDAY.—9.30 A.M., Dr. Burnford: Bacterial Therapy. 10 A.M., Dr. Saunders: Medical Diseases of Children. 10 A.M., Mr. Banks-Davis: Operations on Throat, Nose, and Ear.

Daily 10 A.M. to 6 P.M., Saturdays, 10 A.M., to 1 P.M., In-patients, Out-patients, Operations, Special Departments.

NORTH-EAST LONDON POST-GRADUATE COLLEGE, Prince of Wales's General Hospital.

(At 4.30 P.M.)

MONDAY, April 14th.—Dr. A. J. Whiting: Extra Systole.

TUESDAY.—Dr. J. Metcalfe: The Treatment of Skin Diseases by X Rays.

WEDNESDAY.—Mr. T. H. C. Benians: The Pathology of Blood Infections.

THURSDAY.—Mr. W. E. Tanner: Gall-stones.

MANCHESTER ROYAL INFIRMARY POST-GRADUATE LECTURES.

TUESDAY, April 15th.—4.15 P.M., Mr. P. R. Wrigley: Cervical Rib.

Appointments.

McDONALD, A. D. T., M.B., Ch.B. Edin., has been appointed Medical Officer of Health to the Belford Rural District Council.

M'GONIGLE, G. C. M., M.D. Durh., D.P.H., Medical Officer of Health for Stockton-on-Tees.

PRICE, H. P., L.R.C.P. Lond., M.R.C.S., Medical Officer to the Reading Post Office.

WHEATLEY, ELIZABETH, M.B., Ch.B. Glasg., an Assistant Medical Officer at the Belvedere Fever Hospital of Glasgow Corporation.

Certifying Surgeons under the Factory and Workshop Acts: HALE, R. E. V., M.B., B.Ch. Camb. (Harpenden); MELDRUM, W. J., M.B., Ch.B. Aberd. (Ibstock).

Vacancies.

For further information refer to the advertisement columns.

Aylesbury, Royal Buckinghamshire Hospital.—Hon. Radiologist.
Bethlem Hospital, Lambeth-road, S.E.—Two Res. H.P.'s. Each £25 per quarter.
Birmingham City.—Asst. M.O. £750. Also M.O. for Maternity and Child Welfare Work. £600.
Birmingham Union Dudley-road Hospital.—Obstet. and Gynæcological Resident. £500.
Bradford City.—Asst. School M.O. £600.
Bradford Royal Infirmary.—H.S. £150.
British Guiana Diamond Fields.—Government M.O. £500.
Cardiff, University College of, South Wales and Mon.—Prof. of Pathology and Bacteriology. £1500.
City of London Hospital for Diseases of the Heart and Lungs, Victoria Park, E.—H.P. £125.
Croydon County Borough.—Dental S. £600.
Eastern Dispensary, Leman-street, E.—Dent. Surg.
East London Hospital for Children, &c., Shadwell, E.—H.P. £125. Also Afternoon Cas. O. £120.
East Sussex County Mental Hospital, Hellingly.—Pathologist. £500.
Ebbw Vale Education Committee.—Ophth. S. £7 7s. per session.
Elizabeth Garrett Anderson Hospital, 144, Euston-road.—Asst. Radiologist. £100.
Hemel Hempstead, West Herts Hospital.—Res. M.O. £200.
Hospital for Epilepsy and Paralysis, Maida Vale, W.—2 Asst. P.'s.
Huddersfield Royal Infirmary.—Res. H.S.'s. £200.
Infants Hospital, Vincent-square, Westminster.—Clin. Asst.
Kensington, Fulham and Chelsea Hospital, Richmond-road, Earl's Court, S.W.—Sen. and Jun. R.M.O.'s. £100 and £75 respectively.
Liverpool Eye and Ear Infirmary.—Hon. Asst. Aural S.
London Temperance Hospital, Hampstead-road, N.W.—Med. Registrar. 40 guineas.
Manchester Education Committee.—Asst. School. M.O. £600.
Manchester Royal Infirmary.—Res. M.O. £200. Also Asst. M.O. £100.
Northampton General Hospital.—Hon. P.
Nottingham Children's Hospital.—Res. H.P. £150.
Rainhill, County Mental Hospital.—Asst. M.O. £300.
R.A.M.C. Territorial Army.—Young Med. Practitioners.
Royal Chest Hospital, City-road, E.C.—Clin. Assts.
Staffordshire General Infirmary, Stafford.—H.P. £150.
Union of South Africa Government Mental Hospital Service.—Asst. P.'s. £460.
West Ham Union, Whipps Cross Hospital, Whipps Cross Road, Leytonstone, E.—Fifth Asst. M.O. £434.
West London Hospital, Hammersmith-road, W.—Hon. Med. Reg.
Willesden General Hospital, Harlesden-road, N.W.—H.S. £100.
Willesden Municipal Hospital for Infectious Diseases, Brentfield-road, Neasden, N.W.—R.M.O. £373 9s. 3d.
Willesden Urban District Council.—Asst. M.O. £696.

The Secretary of State for the Home Department gives notice of vacancies for Ophthalmic Specialist Medical Referees under the Workmen's Compensation Act, at Ayr, Kilmarnock, Lanark, Paisley, Greenock, Renfrew, Bute, Isle of Arran, Stirling, Falkirk, Dumbarton, and Clackmannan. Applications should reach the Private Secretary, Scottish Office, Whitehall, S.W., not later than April 30th.

The Chief Inspector of Factories, Home Office, London, S.W., announces the following vacant appointment: Glastonbury, Somerset.

Births, Marriages, and Deaths.

BIRTHS.

HOSKIN.—On April 6th, the wife of T. Jenner Hoskin, M.D., Wimpole-street, W., of a daughter.

HURTER.—On April 1st, at Grassendale, Liverpool, the wife of Herbert R. Hurter, M.D., of a daughter.

LEWIS.—On March 31st, at Gordon House, Braintree, the wife of Dr. T. Percy Lewis, of a son.

MARRIAGES.

HAYES—HUDSON.—On March 7th, at the Cathedral, Bombay, Captain Sydney Nuttall Hayes, F.R.C.S., I.M.S., to Sybil Maud, only daughter of Dr. and Mrs. Wasdale Hudson, Parade, Cowes, I.W.

HINE—ROBERTSON.—On April 3rd, at Dundee, Montague Hine, M.D., F.R.C.S., to Jennette, younger daughter of Mr. and Mrs. J. Masson Robertson, of Alva, Clackmannanshire.

WALLACE—GRANT.—On April 3rd, at St. John's Presbyterian Church, South Shields, J. Montague Wallace, M.A. Camb., M.R.C.S., L.R.C.P. Lond., to Gladys, eldest daughter of Mr. and Mrs. J. Grant, of South Shields.

DEATHS.

BRAMWELL.—On March 31st, at Kenton, Devon, John William Bramwell, M.D., aged 72.

DYER.—On April 3rd, after an operation, Thomas Birch Dyer, M.D., of Brundall, Norwich, formerly Medical Superintendent, M.A.B. Asylum, Darenth, Kent, aged 78.

HAIG.—On April 6th, at Inverness-terrace, London, W., Alexander Haig, M.A., M.D. Oxf., F.R.C.P.

MACKAY.—On March 31st, at a nursing home, Edinburgh, John Sutherland Mackay, M.D.

RICHARDSON.—On April 1st, at Boscombe, after a short illness, Thomas Arthur Richardson, M.R.C.S., L.S.A., aged 69.

WALTER.—On April 2nd, at Stoke-under-Ham, Somerset, Richard Hensleigh Walter, M.B., C.M., F.S.A., aged 62.

WILLIAMS.—On April 1st, John Prichard Williams, M.R.C.S., L.R.C.P. Lond., Captain, R.A.M.C., of The Hermitage, Potters Bar, aged 30.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

THE LANCET: SUBSCRIPTION RATES.

INLAND	One Year	£2 2 0
	Six Months	1 1 0
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	Six Months	1 5 0
	Three Months	0 12 6

SMALL ADVERTISEMENT RATES.

Appointments (Public) Vacant Asylums and Homes Hotels, Boarding Houses, and Baths Books and Publications Houses and Estates Wanted and for Sale. Schools, Medical and Preparatory Nursing Institutes	Four lines and under, 6s.
Financial, Official, and other Announcements Tutors and Tutorships Trade and Miscellaneous Practices and Partnerships Situations Vacant and Wanted	Each additional line, 1s. 6d.

For complete scale of advertisement charges apply to the Manager.

Notes, Comments, and Abstracts.

A REPORT ON THE VOLUNTARY HOSPITALS SYSTEM.

THE second report of the Somerset Voluntary Hospitals Committee [1] is noteworthy in that the voluntary hospital system and the attempts being made to preserve it are discussed on general lines, local conditions being used to illustrate the argument.

The record of the year for Somerset is regarded as the epitome of the hospital work and progress in the whole of Great Britain. The quality of the work done in the individual hospitals shows steady improvement. The increase in size, personnel, and equipment of several institutions is recorded, and it is noted that each year doctors and nurses do higher class work. The old tradition of service shows no sign whatever of weakening. The local hospitals have a very strong hold on the affections of the people.

Criticism of certain local conditions finds a place. The work of one of the special departments of the Royal United Hospital at Bath is said to overlap that of the Ear, Nose and Throat Hospital. Again, while the smaller hospitals were ordinarily only half full, and 150 beds or more were available daily for occupation, the Royal United, Bath, had throughout the year a long waiting list. In the Bath Infirmary there are 217 beds, of which 57 are ordinarily unoccupied. The distance which poor patients can afford to travel to obtain special treatment does not exceed about 20 miles, and access to specialists is practically withheld from about two-thirds of the county. Non-coördination means an uneven distribution of benefits, wasted potentialities, and an inefficient hospital service. The natural evolution towards a well-coördinated hospital system which the country is striving to work out, through its local hospitals and county and municipal institutions, is artificially hindered, in Somerset and throughout England, by the unwillingness of the cities to decentralise, and of the voluntary hospitals to coöperate with public bodies. In November, 1923, a conference of the representatives of all voluntary hospitals in Bristol, Somerset, and Wilts was held at Bristol, and it was resolved to constitute a joint hospitals committee for the three areas. This is the first step towards coördination. Many of the reports issued by hospitals are not complete. One was not issued until December. It is most desirable that the number of in-patients from each parish be disclosed, and how many are private patients. The committee ask that there should be a full medical report, such as will enable subscribers to ascertain the quality and extent of the work done.

The General Position Throughout the Country.

The report is, on the whole, pessimistic in tone. It is pointed out that the results of the energetic efforts made by hospitals, throughout the country, to redeem the financial position from the liabilities incurred during the period of the great war have been disappointing. It is against central general hospitals especially that deficits have piled up, and it is now apparent that they are due to something more than the temporary effects of the war. Most of these hospitals were founded during the eighteenth century, and for nearly 150 years did all the hospital work of the country. They were originally little more than hostels for the convenient treatment of the city paupers, and were maintained by quite a few wealthy men and women of the city; but they soon began to attract patients from the surrounding country. As manufacturers and merchants were, during the whole of the eighteenth and nineteenth centuries, becoming richer and richer, money was always forthcoming to meet capital requirements and the ever-increasing annual expenditure. Thus it became almost an article of faith with managing committees that extensions should keep pace with the demand, and that every effort should be made to increase this demand by conspicuously good work. By 1914, the teaching hospitals, and many other central general ones, had grown into enormous institutions, offering free treatment to all comers from everywhere, and to anyone who could not afford to pay the rapidly increasing cost of an operation in a private nursing home. Between 1914 and 1920 costs and salaries increased at an abnormal rate, but the margin of capital and income, available for charitable legacies and donations, did not expand in the same proportion; expansion was effectively checked by enhanced income-tax and estate duties, and the period of recurring annual deficits commenced.

[1] Bath: The Herald Press, North Gate. Price 6*d*.

The Traditional Assumptions of the Voluntary Hospital System.

The report contends that the English hospital system is based on certain traditional assumptions. It is assumed that the population is divided, by a sharp line of cleavage, into rich and poor, that those below the line are suitable beneficiaries of charity, able, perhaps, to pay something towards their maintenance when in hospital, but nothing for their medical and surgical treatment there, and those above the line are wealthy enough, and numerous enough, to support the hospitals, to pay the charges of nursing homes, and by high fees to remunerate the surgeons and physicians for all their hospital work. It is assumed, also, that the rich of the great cities can afford to provide hospitals, not only for their own poor but for an indefinite number of patients from outside, and further, that these outsiders spread the reputation of the members of the hospital staff and build up their private practices. And lastly, that there is no surgery, and no hospital worth the name, outside the boundaries of the great hospital centres.

The Present Position.

The committee express the belief that none of these assumptions are now justified by actual facts. The success of contributory schemes, and their enthusiastic acceptance, have revealed that a large proportion of hospital patients receive wages that should render them independent of charity, and that they desire to be independent. Whole classes of the "gentry" are kept by sentiment and tradition within the category of "rich," though barely able to meet the cost of living. The aggregate fees which those above the line are able to pay surgeons and physicians no longer constitute fair compensation for the services given to the population generally.

Within the last 30 years the greater part of England has been covered with a network of district and cottage hospitals, many of them admirably equipped, and staffed by visiting surgeons of acknowledged repute, or by men who have had special experience during the war, or by competent graduates who realise that the career of city consultants has become a hazardous speculation. These hospitals have arisen in response to reasonable and natural demands, by the people for treatment as near as possible to their own homes, and by the general practitioners for opportunity to do serious work. There can be no doubt that a large number of cases sent to central hospitals could be treated, at least adequately, in a local one. In the district and cottage hospitals many of the old traditions have been abandoned; outside patients are not admitted, and there is no arbitrary division of the population. It is being discovered that any average area can provide sufficiently good general hospital service for all classes, at a cost which no one finds ruinous, and that the necessary money can be raised by methods which all approve. The classes who provide the paying clientèle to consultants are finding that a district hospital offers a more complete equipment and better service than a city nursing home—at half the cost, and they are refusing to be shepherded into the cities at the tail of the poorer patients.

The Results of the Attempt to Preserve the Old Traditions.

That the very foundations of the voluntary hospital system have crumbled away has been recognised by the management of the central general hospitals, to the extent of soliciting payments towards the cost of maintenance, and regular contributions, from the patient class—but no further. The attempt to preserve the old traditions is reducing nearly all central hospitals to financial straits, and compelling them to resort to sensational, costly, and even undesirable devices for raising money; it is rendering the position of the consultants alarmingly insecure, and making it necessary for the junior staffs to ask for a living wage. It is causing grave discontent among the middle classes, who derive no benefit from the hospitals, and are called on to pay fees artificially enhanced by the antiquated rule which restricts their collection to a small percentage of the population.

To appreciate the general position it is necessary to understand how England is geographically divided for hospital purposes. The patients' register of any district or cottage hospital will disclose the parishes and villages from which its patients are drawn. A district hospital has ordinarily over 30 beds but less than 100; a cottage hospital 30 beds or under. Round any city there is ordinarily a clear space uncovered by any district or cottage hospital; the city itself and this clear space constitute the "city hospital area." Every central general hospital (which ordinarily has 100 beds or more) serves not only the city hospital area but admits patients regularly from an ascertainable number of cottage areas; the city hospital area, and these cottage areas constitute a "central hospital area." A central general hospital, to which a medical school is attached, admits patients from a large number of district

and cottage areas, and overlaps less important central hospital areas; the whole region served might be termed a "teaching hospital area." It must be borne in mind that ordinarily from one-third to one-half of the in-patients in a provincial central general hospital come from outside the city hospital area, and that in teaching hospitals the proportion is very much larger.

The population of every city, district, and cottage hospital area readily admits its obligation to support its local hospital, so far as it benefits local residents. But appeals on behalf of any central hospital have little reaction as soon as the limits of a district or cottage hospital area are crossed, and, consequently, appeals within the city have to be frequent and vigorously importunate. If the experience of Somerset may be taken as having general application, there would be no difficulty in mapping out the whole country into these natural areas, and there are probably few exceptions to the general rule that every area is competent and willing to make hospital provision for its own population, provided that it be free to get the service it needs, and to pay for it in the way it finds most suitable.

From various tables set out in the report it is claimed that the following inferences can be fairly drawn:—

District and cottage hospital areas are not paying their fair share of the cost of the service from which they benefit.

Even the richest cities can no longer find the money for giving free, or very cheap, treatment to as many outside patients as they are attempting to.

It costs less to treat a patient in a district or cottage hospital than in a central general one, less in an ordinary general hospital than in a teaching one, less in a provincial teaching hospital than in a London one.

The difficulty which a central general hospital experiences in collecting from outside areas contributions proportionate to the cost of the services rendered to them varies with the distance of such areas. The wider the area served, the larger the hospital. Hence the probability that any central general hospital in the provinces will have a deficit increases with its size.

The minimum essential staff and equipment of a special hospital are greater than those of a general hospital, but the actual cost of treating each patient seems less. Hence, the cost per bed in a small special hospital is less, and that in a large special hospital is more, than that in a general hospital of corresponding size.

In London, and other cities containing several hospitals, there is in any year an indefinite, but not unlimited, amount which is forthcoming from the public for hospitals generally. For this the several hospitals compete. An important factor in determining the share secured by a particular hospital is the personality of the man who conducts its begging campaign. Though the standard of equipment and quality of service are ordinarily higher in the larger hospitals, the price of land, building costs, rents and wages are higher in crowded cities than in provincial towns or villages, and it is obvious that centralisation, so far as it draws to the city general hospitals cases that can be dealt with locally, involves heavy unnecessary expenditure. In the case of special hospitals centralisation leads to economy, though severely limiting the population which can obtain the benefits of special treatment. The smaller special hospitals are popular and well supported.

The Future.

It is contended in this report that if the English voluntary hospital system is ever to be placed on a permanently stable financial basis, and to provide for all classes a satisfactory and economical hospital service, if the consultants system is to be retained and a fair income assured to surgeons and physicians, certain essential conditions must be fulfilled. The cities must be relieved of some part of the excessive burden which they have shouldered, and be set free to give to the members of their own patient class something more than they now have—the precarious chance of admission if they are in immediate need of operation, or constitute "suitable material" for medical students. The cost of maintaining central general hospitals must be spread over the whole of their areas, and for this a contributory scheme of universal application should be devised, with its organisation based on natural hospital areas, which gives to every hospital such share as it actually earns, and to every contributor good value for his money, not seeking to exploit by purely sentimental appeal. Suitable accommodation must be provided for the middle classes, and they should be given opportunity to insure against serious illness and the normal cost of surgical and special treatment. The claims of the junior staffs to reasonable payment must be admitted, and be taken into consideration when estimating the normal cost of a patient for purposes of the contributory scheme. District and cottage hospitals must be encouraged to do the fullest work of which they are capable. Facilities for special treatment must be extended to country populations remote from the great centres, and the grievance of the country "panel doctor," that he gets no remuneration for hospital cases, be remedied. The voluntary hospitals must work with county and municipal institutions. The cities must abandon their position of isolation, and actively recognise that between them and the country areas exist close ties of mutual obligation. There must be real coördination.

THE FOUNDING OF THE U.S.A. WAR HOSPITALS.

A VALUABLE work [1] has appeared in handsome guise, telling how hospitals for the new armies of the United States were found, built, administered, and afterwards closed. An abstract should be published, for these essays by many hands are so detailed that few will have time to find in them the special points they may be seeking; hardly will even military medical experts be able to assimilate all that is set out. In 1917 there were 9530 beds in military hospitals of all kinds in the United States. At the Armistice there were 120,916 equipped and 27,000 nearly ready, a wonderful tribute to the sound organisation and power of expansion of the U.S. Army Medical Department. The type of hospital favoured was the pavilion, first (p. 16) seen in the R.N. Hospital at Plymouth (1750), and reproduced, after the experiences of the Crimean War, in the Herbert Hospital at Woolwich.

When the United States entered the war, hospitals for the Expeditionary Force were planned to take 2 per cent. medical and 5 per cent. surgical casualties, of whom four out of five were expected to be walking cases. The number of beds in wards varied from 14 to 100; smaller wards were provided for raw troops unaccustomed to live together, larger for trained soldiers, become relatively immune to infectious diseases. Each patient had 800 cub. ft. of space in a ward 11½ ft. high, and some 25 ft. wide, with 70 to 85 sq. ft. of floor area to each bed, and 3 ft. or 3½ ft. between beds. The windows were between alternate beds (two beds between each pair of windows), so each bed had half a window and its own share of light and fresh air; the window surface was one-tenth of the floor area, and ventilation was by sliding sashes and louvred (baffled later to keep out snow) ridge ventilators. Artificial ventilation of a six-story hospital is mentioned on p. 442, but most hospitals were single-storied. The wards were at right angles to the connecting corridors, "annexes" at the nearer, a "solarium" or sun-bath at the further end. Round the ward ran a verandah on to which beds could be wheeled. In the annexe there was, next the ward, a bed-pan room one side, on the other, at first, the nurse's room; later she was given her desk in the ward itself for her papers. There was a serving kitchen (very little cooking was done here); a slop sink and closet for brooms, cleaning pails, &c.; an office for the medical officer; a treatment room; several "quiet" rooms for serious cases (10 per cent.); for every 15 or 20 patients a w.c. seat (no partitions); at first washing-basins in the same proportions (later the basins were withdrawn, and taps remained over a trough); shower baths were 1 for 25, and, like the ablution taps, were supplied with tepid water from a tank with an automatic heat regulator, but one fixed bath with hot and cold taps was also fitted; one urinal stance for every 25 beds. There was always a hospital laboratory, but a clinical laboratory was provided for each 200 beds.

The main hospital kitchen probably served not only the patients but the hospital staff as well. It was planned so that orderlies had not to enter it, thus the cooks were not obstructed. On one side of the kitchen was the hospital store, on the other a corridor, with the main dining-room just across it, thus the food would be served as hot as possible. In the kitchen food was put into large containers, 15 in. by 12 in. by 11 in. deep, and four held dinner for 160 men; in the first soup, in the second potatoes, meat and gravy in the partitioned third, with a second vegetable (two-thirds), and the pudding (one-third of the space) in the fourth. The containers fitted on to the food wagons, and carried meals to the dining-room or to the wards. When staffs dwindled, food was distributed in the dining-room on a "cafeteria" system (for which the editors have only praise), introduced into the restaurants of the United States by Italians. Each patron on arrival takes his place in a queue, and as it passes forward he lifts a tray from a shelf, on it puts what crockery he needs, and at the counter the servers give him his helpings of food, all which he takes away with him to his table. Thus he is his own waiter, and staff is economised. After his meal he returns his used mess-gear to another counter near the kitchen, where are the dish-washing machines. It is found that 20 men can serve themselves from one counter (30 to 35 ft.) per minute, 10 to 15 minutes suffice for each man's meal, thus 300 men are served per hour per counter. Detailed plans are given with exact measurements, even of the food-wagons, the fish-boxes, and the lavatories of the cooks (who are all free from typhoid).

[1] The Medical Department of the U.S. Army in the World War. Vol. V.: Military Hospitals in the United States. Washington: Government Printing Office. Pp. 857. $2.25 (9s.).

There are full accounts of the auxiliary services of the hospitals, the canteens, hospital magazines, housing of the staff, recreation provision for patients and staff, training courses for medical officers (even telling how the less valuable were eliminated). The influenza epidemic of 1918 severely tested the organisation of hospital and the zeal of their staffs. Camp Grant Hospital had 642 patients on Sept. 21st, 1918, and had suddenly to receive 194 fresh cases of influenza that day. By that day week there were 3346 patients in hospital, and 798 were admitted. Deaths had so far been few, but they now increased, and new cases fell off, so on Oct. 6th there were only 370 admissions, with 430 discharges, but there were 99 deaths. The story of this outbreak (pp. 241 seq.) will well repay perusal. A laundry of its own usually saved money to a hospital, especially if it did gauze reclamation. Gauze, taken off a patient, was put for 12 hours in 1 per cent. cresol solution, boiled, washed in a machine, bleached, and dried. It was then put up in suitable parcels, sterilised, and used again without any disadvantage.[2] Hospital laundries always pressed patients' uniforms. A small motor truck with trailer, both quite small, were found most useful for taking stores issued round the hospital that was lucky enough to have "found" them. Stores and equipment of wards are, technically, "property," and it was found necessary to have a "property officer" in each section to watch over it: the chief officer of the section had no time for even that important work, and it fell to a specially designated junior officer. Fire protection was most carefully watched in these so often wooden hospitals; thus, kitchens were built with expanded-metal, instead of wooden, laths.

The index and illustrations of this book are, like the paper and printing, very good. The regimental inspection room (p. 108) plans are just what a medical officer wants and hopes for. Alas, that it should be so often in vain.

HANDBOOKS ON BRITISH AND FOREIGN SPAS.

THE British Spa Federation, comprising the spas of Bath, Buxton, Cheltenham, Droitwich, Harrogate, Leamington, Llandrindod Wells, Strathpeffer, Woodhall, and New Zealand, have issued their new Federation Handbook,[3] which is intended for the use of members of the medical and allied professions. A copy of it is being sent to every medical man in the country. The outlines of medical hydrology and spa treatment as practised in this country are dealt with clearly and concisely. The general practitioner will find it of much help in advising his patients as to the choice of a spa. The book is illustrated, and contains an introduction by Dr. Fortescue Fox.

The object of another small guide[4] on a cognate subject which has reached us is to aid in the choice of a spa or health resort for patients suffering from illness as a result of residence in the French Colonies. It deals not only with the well-known spas in France, but also with those in the French Colonies. Information, from trustworthy authorities, in a simple and handy form is laid before the practitioner. The book is illustrated and contains a preface by Dr. Paul Carnot, Professor of Therapeutics, Paris.

RESEARCH ON CONTRACEPTIVES.

Two years ago a special medical research committee was constituted by the Society for Constructive Birth Control and Racial Progress, with the allotted task to consider critically the physiological and psychological reactions of various methods of birth control. The members of this committee are as follows: Sir James Barr, Sir William Bayliss, Mr. Harold Chapple, F.R.C.S., Dr. Jane Hawthorne, Dr. George Jones, Barrister-at-law, Dr. Maude Kerslake, Sir W. Arbuthnot Lane, Sir John MacAlister, Sir Archdall Reid, Dr. Christopher Rolleston, Dr. D. Sommerville, Mrs. Marie Stopes, D.Sc., Dr. H. M. Telling, Dr. Mather Thomson, and Mr. E. B. Turner, F.R.C.S. The proceedings and minutes of this committee are confidential, and none of its deliberations is published, except about points which are specially passed for publication. A number of new or supposedly new methods have been brought before it from various quarters, and a statement just issued states that due consideration confirms the view that no one method is applicable, but that several of the simple and well-known methods which have had a long trial still are the best to meet ordinary requirements. At the last committee meeting the following resolution was passed for publication: "The Medical Research Committee of the Society for Constructive Birth Control and Racial Progress wishes to place on record its joint and several opinion that the methods now used at the Mothers Clinic are the best known at the present time." Communications from anyone desiring to bring matters for discussion before the research committee, or to present scientific results for its consideration, should be addressed to the hon. secretary, C.B.C., 7, John-street, Adelphi, London, W.C. 2.

Corrigendum.—Mr. J. B. S. Haldane writes from the Biochemical Laboratory, Cambridge, to correct an equation which appeared in his article on Human Tissue Alkalinity (THE LANCET, March 15th, p. 537). This should run:—

$$2\,NH_4Cl + 2\,NaHCO_3 = 2\,NaCl + CON_2H_4 + CO_2 + 3\,H_2O.$$

THE presidential address on Environment and Health delivered by Mr. Charles P. Childe at the ninety-first annual meeting of the British Medical Association, held at Portsmouth in July, 1923, has been reprinted as Fabian Tract No. 208, and may be obtained at the Fabian Bookshop, 25, Tothill-street, Westminster, S.W. 1, price 2*d*.

CATALOGUE No. 234 (1924) of scientific books issued by W. Heffer and Sons, Limited (4, Petty Cury, Cambridge), contains special sections dealing with (8) Physiology, Anatomy, and Medicine; and (9) Psychology and Psycho-Analysis. In the former is included an important collection of journals on ophthalmology and otology, and many other series or partial series of archives, journals, and centralblatts are offered for sale.

Messrs. Burroughs, Wellcome and Co. inform us that the medical supplies carried by Squadron-Leader Maclaren, who is in command of the British machine engaged in the round-the-world flight, consist of two light aluminium cases containing emergency bandages, dressings, sundry surgical appliances, as well as "tabloid" medicines in featherweight containers representing 364 separate doses. The complete medical equipment weighs only 24 ounces. The American expedition, organised by the U.S.A. Army Air Service, which started eight days before the British, has each of its four airplanes similarly equipped with an aluminium case containing "tabloid" medicaments and dressings.

[2] At Camp Grant the expenditure on new gauze was by "gauze-reclamation" reduced from 700 yards per day to 10 yards per month!

[3] The Spas of Britain. The Official Handbook of the British Spa Federation. Compiled from the reports of the local Medical Committees. Bath: Pitman Press. 1924. Pp. 170.

[4] Le Bréviaire Thermal des Coloniaux. By J. J. Matignon, Consultant Physician, Châtelguyon, and S. Abbotucci, Medical Officer (1st Class), Colonial Troops. Paris: A. Maloine et Fils. 1923. Pp. 152. Fr.8.

The Services.

ROYAL ARMY MEDICAL CORPS.

Capt. F. H. Woods retires, receiving a gratuity.

ARMY DENTAL CORPS.

Capt. E. Smith retires, receiving a gratuity.

TERRITORIAL ARMY.

Lt.-Col. M. B. Ray, from R.A.M.C., T.A., to be Col. and Asst. Director of Medical Services 47th (2nd Lond.) Div. T.A.

Capt. E. G. Howell resigns his commn. and retains the rank of Capt.

E. A. Wilson to be Lt.

Capt. J. H. P. Fraser, from Gen. List, to be Maj. and to command 7th (Southern) Sanitary Coy.

ROYAL AIR FORCE.

Flight Lt. E. G. S. Hall resigns his short service commission.

Flight Lt. (Hon. Squadron Leader) A. E. F. F. Huntsman relinquishes his temporary commission on account of ill-health, and is granted the rank of Squadron Leader.

Flight Lieut. V. R. Smith is granted a permanent commission in the rank stated.

Flight Lieut. (Hon. Squadron Leader) G. D. Kerr relinquishes his temporary commission on ceasing to be employed and is permitted to retain the rank of Flight Lieut.

Flying Officer J. M. Rourke relinquishes his short service commission on account of ill-health.

INDIAN MEDICAL SERVICE.

Lt.-Col. T. H. Symons to be Maj.-Gen.

Capts. P. J. Veale, Heerajee Jehangir Manockjee Cursetjee, P. F. Gow, J. S. S. Martin, J. W. Jones, and J. H. Hislop to be Majs.

Lt. P. A. C. Davenport to be Capt.

Temp. Capt. P. A. C. Davenport to be Lt. and to retain his temp. rank of Capt.

J. F. Shepherd to be Lt.

The King has approved the grant of a temporary commission to Khushi Ram as Lt.